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THE

EDINBURGH MEDICAL JOURNAL

NUNQUAM ALIUD NATURA, ALIUD SAPIENTIA DICIT.

THE
EDINBURGH
MEDICAL JOURNAL

EDITED BY

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NEW SERIES
VOL. XXII

EDINBURGH & LONDON
YOUNG J. PENTLAND
1907

CATALOGUED
APR 23 1908
E. H. B.

EDINBURGH: PUBLISHED FOR THE EDINBURGH MEDICAL JOURNAL LTD.
BY YOUNG J. PENTLAND, 11 TEVIOT PLACE, AND 21 WARWICK LANE, LONDON, E.C.

10138

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EDITORIAL.

University Shackles.

THE four Scottish Universities fared at the hands of the last Commission somewhat in the same way as did the unfortunate wayfarers who, according to the old myth, fell into the clutches of the robber Damastes. An incomprehensible desire for uniformity led the Commissioners to increase or diminish the size of each of the Universities in a manner at once arbitrary and futile. In one respect the victims have met a worse fate than that of the sufferers upon the "bed of Procrustes," since they have been, through another obsession of the Commissioners, tightly chained together. In the ancient legend there is no mention of such an added misery to the tortures inflicted by the robber chief. It must necessarily happen that the most restless member of the quartette will cause additional uneasiness to one or more of the other three. When the mother of the celebrated Sir David Baird was informed that her son was in captivity chained to another prisoner, her only remark was, "God help the lad that's chained to oor Davy!" Our sympathies are not so restricted as those of the hero's mother, and extend to all the members thus bound. None of the Universities is able to move hand or foot without consultation with the others, and the effect of this is to render the improvements and changes, demanded from time to time in consequence of modern advances, extremely difficult of attainment, by processes which are cumbrous and lengthy.

On all hands there are evidences of dissatisfaction with the present impossible state of matters, and a cry for autonomy is heard on every side. Each of the Universities should certainly be allowed to work out its development without let or hindrance, so as to specialise in those directions in which it may be most useful to the cause of education. Imbued with these sentiments, the University Court of the mother of the Scottish Universities, during the course of last winter, sent a communication to the other three University Courts in favour of taking steps to obtain greater freedom of action for each. In doing this the St. Andrews Court suggested that, until the time came, as come it will, when the present shackles will be struck off, each of the University Courts should send representatives to a joint conference when a new ordinance is proposed by any of the Universities, so as to have a friendly interchange of ideas, and in this way to prevent or to lessen the present tendency on the part of the Universities to thwart each other in their attempts to obtain improvements in their arrangements. The St. Andrews proposal has so far been replied to only by the University of Edinburgh, and that reply is unfortunately characterised by timid procrastination and helpless irresolution. The reply, forsooth, is to the effect that the time is not opportune for the discussion of such a proposal. Surely something better might have been expected from the governing body of the largest of our Universities. It almost seems as if the members of the Edinburgh University Court were afraid that the suggestion which was made by the governing body at St. Andrews contained within it the germs of a proposal adumbrated by the Commission for a joint University Court for Scotland. So far as we have been able to understand, nothing of the kind ever entered the mind of any member of the St. Andrews University Court, and the proposal was accompanied by the explicit statement that the suggestion was only intended to facilitate deliberation until the time when each University will regain perfect freedom. Attempts at reform will be well-nigh hopeless so long as such feeble and faltering purpose as that which has unfortunately characterised the action of the Edinburgh Court in this matter is exhibited by the Universities. How long must we wait for a new Theseus to rid us of Damastes?

Dual Hospital Appointments. DURING the last few years a question in imperial and municipal government has not infrequently been raised relative to Members of Parliament or of Town Councils holding directorates in Companies which might militate against impartial action by them, if the concerns they were associated with became matters of public discussion or judicial consideration. Generally it has been decided that the purity of public life should be safeguarded by the retiral from such directorates of those who may at any time be called upon to act the part of judges in matters even remotely related to such Companies. In this age of democracy the tendency has also been to insist that men paid out of public funds should be restricted in their work, and devote their whole time to the appointments for which the public pay them. This often means inadequate remuneration, or, in many cases, the appointment of inferior men, as the more energetic and capable do not elect to have their energies thus curtailed. We admit that public offices for which payment is received must be carefully safeguarded, so that the men who hold them do the work thoroughly and efficiently; but we confess to feeling surprise when an endeavour is made to tie down honorary officials, and prevent, or suggest the expediency of preventing, the physicians and surgeons in the Royal Infirmary from accepting or holding posts in hospitals outside the Infirmary. Some months ago a circular letter was addressed to the Honorary Staff of the Infirmary by the Managers, requesting that each member of the Honorary Staff should state what hospital appointments he held, and the time required to fulfil the duties.

When the circular was received by the Staff, it was felt that if the Managers knew how important it was that in every way experience of medical work should be acquired, especially by the junior members of the Staff, to fit them for the increased responsibilities which they would have later, but also by the seniors, who in smaller institutions had opportunities of doing highly specialised work, they would recognise that the circular had been sent through misapprehension, and the subject would drop. A small deputation from the Staff accordingly met a committee of the Managers, and explained that the appointments held by some of the Honorary Staff in other medical charitable institutions did not in any way interfere with those members doing their work efficiently in the Infirmary, and indeed enabled them to do it better, because such outside appointments went far to increase the efficiency of the individual physician or surgeon.

To some of the Managers of the Infirmary this aspect of the case did not appeal, and we understand that a further endeavour is being made to prevent members of the Honorary Staff from holding outside appointments in hospitals. On this occasion the attack, to use a Revenue phrase, is "at the source." Candidates for assistant appointments or reappointments are to be required (so rumour has it), if elected, to ask permission from the Board of Management to accept, or continue to hold, outside positions. From one point of view this seems an unfortunate interference with the independence of individuals; but the more serious element of it is that, if plural appointments are prohibited, the Infirmary will suffer, as the patients will be debarred from receiving the best skill available. The suggestion of espionage of this kind is, to say the least, unworthy of men who hold the honourable position of managers of a noble institution. Hitherto there has been harmony between the Management and the Honorary Staff in the Infirmary; so long as the work has been efficiently done by individual men, credit has been given them for the time and strength they have expended in healing the sick, and it will be singularly unfortunate if the freedom of the Staff be interfered with. In all conscience, the work the Managers have to do is large enough and important enough without the addition of supervising the private affairs of the individual members of the Honorary Staff. If work in the Infirmary has been neglected by one or more of the Honorary Staff, the duty of the Managers is clearly to speak to the official or officials who have been neglectful, but hitherto no rumour of a reprimand having been given for neglect has reached us.

Dental Legislation.

At the annual meeting of the British Dental Association, from the mass of subjects discussed there emerged three matters of general interest. Firstly, it appeared that the two Bills introduced into the House of Lords by the initiative of the General Medical Council had aroused in the Association feelings of profound disappointment, and even of bitter resentment. These Bills are intended to deal with medical and dental practice by Limited Companies; and whereas medical practice by Companies is rightly proposed to be altogether prohibited, dental practice by a Company is permitted, provided it be carried on by registered dentists. The evils that follow on the practice of either medicine or dentistry by Companies are well known, and have been recapitulated by the witnesses who have given evidence before the Select Committee of the Lords to which the Bills were referred. The logical process which induced the General Medical Council to believe that the disciplinary powers it possessed could cope with these evils when perpetrated by dentists, but were of no avail in the case of doctors, is difficult, if not impossible, to understand. It is certain that the action of the Medical Council is regarded by the dental profession with dismay and indignation. It is felt, and we think justly, that the distinction drawn between the practice of medicine and dentistry is most invidious, and casts an unmerited slur on honourable practitioners, who, though their advice remained unsought and their wishes were ignored, have hitherto imagined that their interests were safe in the hands of their rulers, the General Medical Council.

Secondly came up for discussion the recent recommendation of the Medical Council that a period of two years' mechanical training be accepted as "sufficient" by the Licensing Bodies, instead of three years. The body of opinion outside the London Dental Schools is in favour of three years as the minimum. This reduction may attract students, but it seems likely to diminish the efficiency of their training. We therefore note gladly that the Edinburgh College has resolved to demand the full term of three years as heretofore.

The third subject claiming attention was the condition of the teeth in children of school age, and the means that should be taken to prevent and treat the dental caries, which seems everywhere to be prevalent to an alarming extent among school children. It appears probable that legislative sanction may be given to the first step necessary, namely, inspection of the teeth. This, however, will not be of much avail unless its corollary—treatment by extraction or conservation — be provided for. The task is too great for philanthropic effort, and neither municipal or imperial economists can be expected to hail with enthusiasm a project estimated to cost £1,200,000 per annum. Still, knowing as we do that oral sepsis is not only a potent factor in the causation of many diseases, but also exerts a most maleficent influence in their course, we should welcome any feasible proposal to provide for the treatment of dental caries in those unable or unwilling to pay for skilled attention. Perhaps some day we may get a Minister of Health who may go to the country with a new election cry: "*Dens sanus in corpore sano!*" In the meantime the British Dental Association is showing a praiseworthy zeal in tackling a difficult and important problem.

Recent Investigations on the X-rays.

EACH new field of investigation into the properties of the X-rays yields a rich and sometimes unexpected harvest. The Annual Report of the German Society for the Study of the X-rays is again replete with a number of interesting observations. The most injurious influence of the X-rays would appear to be exerted, first on the lymphoid, and secondly on the matrix or germinating tissues of the body; and even short exposures of the bones of young animals, and especially those of the skull, suffice to bring about serious impairment of growth. In the case of the testes the blighting influence of the rays falls mainly upon the cells of the seminal tubules, so that the spermatozoa disappear from the seminal fluid, while the intermediate tissue remains intact; and Willemin therefore regards the intermediate tissue as the source of the internal secretion of the testes, as, after the complete disappearance of the spermatozoa, the capacity for sexual intercourse is not diminished.

If animals at an early state of pregnancy are exposed to the rays, the products of conception may entirely disappear, while at a later stage the offspring are either born dead or die soon after birth. These results were more easily obtained in small animals up to the size of the rabbit than in larger animals such as the dog, in which the exposure had to be carried to the extent of burning the skin. The important observation was made, that while the seeds or seedlings of plants were seriously impaired in vitality and in growth as a result of exposure to the rays, bacteria were not influenced in the slightest degree, and their vitality was not in any way diminished even after exposures of several hours' duration.

Among the diseases which have been found to benefit from the influence of the rays are to be mentioned leucæmia, Hodgkin's disease, external cancer, tuberculous glands, diseases of the skin, exophthalmic goitre, tuberculous disease of the fingers and toes, and certain diseases of the cornea, such as trachoma. In leprosy the results observed by Wilkinson in the Leprosy Hospital in Manila are truly remarkable, there being an entire disappearance of the diseased tissues after exposures of comparatively short duration.

Another interesting observation is the beneficial influence of the rays on such innocent growths as fatty tumours and keloid, for this would tend to support the belief that the origin of tumour growths is the same both in the innocent and malignant varieties.

We have merely touched on one or two points in the interesting report to which we have referred, but it is evident that in the course of the next few years still more remarkable developments will fall to be recorded.

WE tender our congratulations to Sir Thomas R. Fraser on his admission to the honorary degree of Doctor in Science at the University of Cambridge. The public orator commended him for his services as Professor of Materia Medica in the University of Edinburgh, his labour as President to the Commission of Inquiry into the plague in India, and his physiological and therapeutic investigations.

ON behalf of those medical men who make a point of arranging their holiday undertakings a long time in advance, it may be noted that the Sixteenth International Medical Congress is to be held in Buda-Pesth on the 29th of August 1909. This city, which is the capital of Hungary, and remarkable for the interest and beauty both of the town itself and of its surroundings, is justly famous for the excellence of the work which is done in its medical school and for the great reputation of the professors in its university.

AT a meeting of Managers of the Royal Infirmary, help 24th June, Dr. Chalmers Watson was appointed Assistant Physician, and Mr. Wm. J. Stuart, Assistant Surgeon.

ORIGINAL COMMUNICATIONS.

THE CAUSE OF THE HEART-BEAT.[1]

By G. A. GIBSON, M.D., D.Sc., LL.D., *Physician to the Royal Infirmary, Edinburgh.*

ON glancing over the Orations of the Medical Society for the last twenty years, it is clear that most of the previous occupants of the distinguished position to which your generous kindness has called me have occupied themselves with matters, whether of wide general interest or more restricted application, to which they have given particular attention. Following in the path chosen by my predecessors, the best mode of showing my appreciation of the honour which you have done me will certainly consist in devoting my remarks, with your permission, to some subject with which I am more specially conversant.

Time and again, the mind of man has in the past appeared to reach the end of fruitful endeavour. Knowledge has been accumulated and facts have been gathered until a stage has been reached when further advance has appeared to be impossible. This was the case at several epochs during last century; observers looked back with amazement at the strides which had taken place, and shrunk from looking forward, in despair of being able to add anything to the general store. Yet, when considering these particular times at a later period, it has been clear that during them mankind has been blind to the riches of nature lying ready for research. Nowhere is this better expressed than by the distinguished Sir Isaac Newton. "I seem," he says, "to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great Ocean of Truth lay all undiscovered before me." The reflection is one well calculated to cheer us in any mood of despondency, as showing the possibility for each and all of us in our several spheres to contribute something to modern science. In this connection, one of the beautiful legends of antiquity inevitably rises before the memory. You remember how Philemon and Baucis were sitting at their door after the evening meal, when two travellers, who had been refused shelter at the hands of the neighbouring villagers, approached the cottage. The worthy couple courteously invited the travellers to enter their abode, and set before them of their best. To the sorrow of Baucis, however, their store was scanty, and one or two deep draughts exhausted the milk contained in the pitcher. At the magic touch, however, of the staff which was carried by the younger of the two travellers, the vessel became endowed with inexhaustible properties. Little wonder that it was so, for the

[1] The Oration of the Medical Society of London, delivered 27th May 1907.

two travellers were Zeus and Hermes. Nature is, indeed, like the pitcher of Baucis—when approached by the right person she yields an unending supply.

In the domain of the circulation, remarkable strides have been made within the last few years, not only in the clinical study of its disturbances, but also in the pathological observation of its structural changes, the physiological investigation of its normal phenomena, and even the anatomical elucidation of its morphological features. In all these different branches of study numerous new facts have been brought to light, and much of our knowledge has been literally recast. Unfortunately, the interpretation of the facts is not always such as will satisfy the inquiring mind.

It may savour of temerity to enter upon the discussion of such a thorny subject as that selected for this evening. Not only does it abound with inherent difficulties of no ordinary kind, but these have been rendered more serious by the warmth which has too often entered into the discussion of the subject. It has, indeed, formed one of the battlefields of modern science. Doughty champions have entered the lists in defence of views which they have been led to espouse, and in one or two quarters the discussions which have arisen have been, to put it mildly, somewhat acrimonious. To my own mind it has been a subject of regret that certain of the protagonists seem to have regarded the views which they hold as little short of infallible dogmas, and have emulated the fervour of the Churchman—no disrespect is implied in this remark—rather than the inquiring spirit of the man of science. In the quest of truth, it is our bounden duty to be in earnest. "Felix qui quod amat defendere fortiter audet" is an admirable motto; there are, however, ways of upholding what we know to be true and of defending what we feel to be right, without sinking into unseemly wrangles. "A good cause," says Sir Thomas Browne, "needs not to be patroned by passion, but can sustain itself upon a temperate dispute." In the attempt which is now about to be made to ascertain the facts in regard to one of the much debated problems of the present age, it will be my duty to avoid anything savouring of partisanship, and to remain free from heat in the discussion of the arguments. My sole aim will be to make an honest effort to attain as nearly as possible to the real cause of the appearances under review, remembering the wise remark of Carlyle: "Truth of any kind breeds ever new and better truth."

The literature which has already grown up in connection with the subject is enormous. It is quite impossible, in the compass of a single lecture, to do more than refer to the really important contributions yielding something more than mere destructive criticism. For an excellent summary of the whole question of the cause of the heart-beat, let me refer to the learned article of Langendorff in the "Ergebnisse der Physiologie," and allow me further to add that, while this oration was in course of preparation, two interesting addresses have appeared on the subject by Wesley Mills and Alexander Morison.

Harvey made no attempt, even in that chapter which forms the most beautiful part of his immortal work, to explain the causes of the pulsation of the heart, and we have to pass on till a period a hundred and thirty years later before we encounter any attempt to define the problem. Cardiac movements were originally attributed by Albrecht von Haller to an inherent power of contraction belonging to the heart itself. It has been claimed that he regarded the automatic movements of the heart as due to an inherent faculty of the heart muscle. This, however, is not specifically stated, and, as the intimate nervous connections were then unknown, it is probable that the intrinsic nature of the movements did not particularly trouble the mind of that great observer. Senac also regarded the pulsation of the heart as due to special cardiac activities, but he at the same time laid greater stress upon external sources of interference. With these vague views, pathologists as well as physicians were content until the middle of last century. The discovery of the ganglia at the junction of the sinus and auricle by Remak, of those between the auricle and ventricle by Bidder, and of those between the two ventricles by Ludwig, necessarily opened up the possibility of some definite explanation, and the formal presentation of the views which resulted was given by Volkmann, who enunciated the theory that the pulsation of the heart was due to the automatic action of its intrinsic ganglia.

These views, however, were modified in certain respects, from time to time, by the investigations of several observers. It is only necessary to mention the experiments of Eckhard, as well as of Foster and Dew Smith, upon the apical region of the heart, and the further researches of Bowditch and of Merunowicz on the influence of different nutrient fluids upon the same cardiac region, to show that modifications of the explanation went on. The general result of these different investigations, however, was embodied in the theory stated by Rosenthal, that impulses flowed from the ganglia in the sinus and produced the rhythmic action of the heart.

In the minds of those, nevertheless, most competent to form a judgment in respect of the facts, a considerable degree of doubt existed in regard to their explanation. This cannot be better proved than by referring to the remark of Foster, in the first edition of his "Text-book of Physiology," which appeared two years after Rosenthal's statement; this we may take to be a landmark or guide to the state of knowledge of the epoch in which it appeared. "In the sporadic ganglia," Foster says, "the evidence of automatic action seems more clear, and yet is by no means absolutely decisive. The beat of the heart is a typical automatic action: and, since the heart will continue to beat for some time when isolated from the rest of the body (that of a cold-blooded animal continuing to beat for hours, or even days), its automatism must lie in its own structures. When, however, we come to discuss the beat of the heart in detail, we shall find that it is still an open question whether the automatism is confined to the ganglia (either of the sinus venosus, auricles, or auriculo-ventricular boundary), or shared in by the muscular tissue: whether, in fact, the automatism is a muscular automatism like that of a ciliated cell, or the automatism of a differentiated nerve cell. And yet the heart is the case where the automatism of the ganglia seems clearest."

At this point we reach the parting of the ways.

The long series of researches made by Gaskell and embodied in a valuable paper, which has for well nigh a quarter of a century been a constant subject of study amongst all of us interested in the problems of the circulation, may be regarded as the starting-point of the myogenetic theory. In this admirable contribution the author enunciates two laws, as follows: "The power of independent rhythmical contraction decreases regularly as we pass from the sinus to the ventricle," so runs the first law; the second is—"the rhythmical power of each segment of the heart varies inversely as its distance from the sinus." These conclusions have never been controverted, and from an exoteric point of view there is practical unanimity regarding them. It is when we approach their esoteric consideration that we are struck by the fact, and it is a somewhat important fact, that the phenomena are susceptible of explanation in two absolutely antagonistic ways. Going on to examine the rhythm of the heart and the contraction of its walls by the study of movements in strips of muscle, Gaskell concludes that the contractions are myogenetic and automatic. He bases his belief in the myogenetic origin of the contractions on the absence of special nerve structures, and on the fact that when the rhythm is once well established the strip can be cut into small pieces, each of which will still continue its rhythm for a long time. The origin of the movements must, therefore, according to Gaskell, be either in the muscle cells or nerve fibres, as was suggested by Schiff in discussing the movements of the heart. It is to be noted in passing that Gaskell does not deny nerve influence. By the method of its development Gaskell was led to the conclusion that the rhythm is due to some quality inherent in the muscle itself, *i.e.* that it is automatic. He holds that nothing can be more striking than the nature of its development, the gradual recovery of conduction, the steady increase of the contraction, the uniform augmentation of excitability—all show a steady improvement in the activity of the processes upon which the various properties of the muscle depend, which is manifested by the outburst of automatic rhythmical contractions. It continues for many hours after the discontinuance of all stimulation. Gaskell shows that the ventricle contracts in due sequence with the auricle, and shows by experiment that this occurs only when a contraction wave passes to the groove. He points out the special structure of the muscular fibres at the sino-auricular junction, forming a regular band or muscular ring from which the fibres of the auricle take their origin; and again at the auriculo-ventricular junction, where there is another well-defined ring of parallel muscular fibres, from which, in part, the muscular fibres of the ventricle take their origin. The existence of these two muscular rings connecting the two muscular cavities of the heart is, according to Gaskell, amply sufficient to account for the passage of the contraction from the sinus to the auricle, and from the auricle to the ventricle, without the necessity of invoking the presence of ganglion cells. He next repeats the experiments of Eckhard and Marchand, which led them to conclude that the auriculo-ventricular ganglia are essential for the due sequence of the ventricular upon the auricular contractions in the frog, and he asserts that, after removing them, the sequence continues just as well as before. From a few observations upon the heart of the skate, he concludes that it affords a good example of the peristaltic nature of the heart-beat, and also furnishes a new proof that the starting-point of the peristaltic contractions is determined by the nature of the muscular substance, rather than by the presence or absence of ganglion cells.

Gaskell proves that the cardiac nerves are able to increase and diminish the conductivity of the muscular tissue of the auricle, and he points out that the refractory phase discovered by Marey is applicable to any portion of cardiac muscle along which a contraction wave passes, so that a certain time must elapse after every wave before conductivity is sufficiently restored to permit another to travel. The effect of injury caused by experiment is to retard the process of restoration so that a longer time must elapse after a contraction has occurred. He finds, however, and the fact is of great importance, that nervous action can remove a partial block, and that it does so because it expedites the recovery of the conduction power of the muscle. One of the most important results of this valuable contribution of Gaskell is to show that by nervous influences there may be increase or diminution of the five different aspects of cardiac activity which he analysed—rhythmicity, excitability, conductivity, contractility, and tonicity.

The chief criticism to which the observations and deductions of Gaskell are open lies in the fact that there is in every case the presence of nerve tissue. Further, the changes in rhythmicity and the other functions which he describes as the result of experiments on the vagus, seem to me strong arguments for a nervous origin of these functions.

In one of his interesting contributions, Carlson points out that we know nothing of any action of the heart in the absence of, or apart from, motor and augmentor nerves. It is certainly true that no drug abolishes the action of these nerves without producing some damage to the heart muscle, and therefore experimentation on the vertebrate heart involves, not merely the heart muscle, but the motor and augmentor nerves. He further contends that there is as yet no proof that the vagi act directly on the heart muscle, and that it is as easy to explain the results of experiments on these nerves by means of the neurogenetic as of the myogenetic theory. He holds that Gaskell's researches and observations do not prove such a direct action, and he does not believe that Porter is right in regarding his own experiments as proving the myogenetic view.

The long series of papers produced by Engelmann upon the properties of cardiac muscle may be regarded as containing the most exhaustive statement of the myogenetic theory, and the oration which he delivered in December 1903 may be accepted as the concluding summary, up to the present date, of his views. In this eloquent and interesting address he points out that the most important difference between the two explanations of the cardiac movements lies in the entirely different interpretation of the ganglionic system of the heart. Both hypotheses equally acknowledge that the source of the stimulus and the mechanism of co-ordination lie in the heart itself. He recalls how the analogy of the automatic and rhythmic stimuli by nerve centres of co-ordinated muscular movements, as in the respiration and the digestion, furnished a hypothesis for the movements of the heart which gradually became a dogma, and, for many, even an axiom. He shows that the first shock which the neurogenetic theory received came from observations upon the ureter, which can be observed in the total absence of ganglion cells to manifest spontaneous peristalsis, and even shows something like the refractory phase seen in cardiac activity. But it seems to me that in this statement sufficient account is not made of its nervous structures. Engelmann states that stimulation of the efferent nerves fails to produce contractions of the ureter, while irritation of the muscular wall excites contraction. But in this statement there is no proof. As is well known, the ureter is abundantly supplied with nerves, and in cases of obstruction the contractions of its walls are experienced in the form of severe pain. Who can prove that the movements caused by direct irritation are not the result of stimulation of the nerves contained in the walls? There remains the statement that stimulation of the nerves coming to the ureter fails to produce contractions. Before finally accepting this assertion, the experiments will require once more to be repeated.

In the next place, Engelmann points out that the possibility of independent periodic contractions is not entirely confined to those parts of the heart which contain ganglion cells, and he therefore assumes that these structures are not necessary for the production of rhythmical contractions. As is, however, now universally recognised, ganglion cells are scattered over every part of the heart, and inasmuch as the property of spontaneous contraction is directly proportional to the number of these ganglion cells, the force of the argument seems to me to lie otherwise than is put by Engelmann and the rest of the myogenesists. It has further been proved by Berkeley, Morison, and others, that innumerable nerve cells interlace with the muscle cells in every part of the heart. This fact is admitted even by the most ardent upholders of the myogenetic theory, and they allow that it is difficult to advance any convincing proof of their views in consequence of the close connection between muscle cell and nerve fibre. Kronecker, who has consistently opposed the myogenetic conception, very ably discusses this aspect of the question in his Hamburg address, and we know that Dogiel, Apáthy, Bethe, and Nissl attribute very important functions to nerve fibres. Bearing upon this particular aspect of the subject, it may be stated at this point, that Wenckebach, who is one of the stoutest upholders of the views of Gaskell and Engelmann, is driven to state that it is, in itself, more probable that an important function like the production of the stimulus to contraction, which is maintained for a considerable time in an excised portion of the heart wall, should have its origin in the intact muscle cells than in the separated nerve fibres. This argument has absolutely no weight; we shall see afterwards that the nervous textures of the heart retain their vitality long after the heart muscle has become absolutely functionless, when both are equally subjected to destructive influences.

The arguments from embryology, based particularly on the researches of the younger His, are powerfully stated by Engelmann. It is acknowledged on every hand that in the development of the chicken the heart begins to show movements as early as the second day, whilst the first appearance of the cardiac ganglia takes place on the sixth, and that, according to Pflüger, the human embryo shows periodic movements of the heart in the third week, while ganglion cells are only developed in the fourth. Engelmann pertinently asks, Why should neurogenetic automatism be necessary in the later periods of development, when it is unnecessary in the earlier? In other words, Why should the cause of the heart-beat be different after the entrance of the cardiac ganglia to what it was before?

It cannot be gainsaid that these embryological considerations constitute the most important of all the arguments in favour of myogenesis. The heart of the embryo certainly beats before any specialised nervous tissue can be discovered in connection with it, but it must also be remembered that it beats before any distinctive muscular structure can be demonstrated in it. The argument has, therefore, been pushed too far, and although the facts absolutely prove that the functions of the embryonic heart are automatic, they do not prove that these functions are more myogenetic in origin than the movements, for example, of an amœba. In Wenckebach's remarks upon the subject he mentions that phylogenetically the muscle cell has developed from a less differentiated cell with nervous and muscular properties, and recalls that, in the lower animals, nervous impulses and contractile processes are united in the same cell. It is difficult indeed to see how such facts can be construed as arguments in favour of the myogenetic theory.

Engelmann further lays stress upon the observations of Biedermann, that ordinary voluntary striped muscle fibres in the fully grown frog may be caused to show periodic twitchings in salt solutions after every nervous influence has been shut off by means of curara. But how far the effect of curara upon the different nervous tissues has gone in such experiments has yet to be proved. These various considerations have led Engelmann to the conclusion that the source of the automatic stimulus of the heart is to be placed in the muscle cells, and not in the cardiac ganglia. Recognising the muscular tissue of the sinus as the site of origin of normal stimuli, he asks the further question, whether these stimuli arise everywhere in it or only in a restricted spot? He holds it a matter of much importance, as now determined by recent researches, that the sinus is possessed in all its parts of the power of producing automatic stimuli, although not to the same degree in every region. In this we shall see he is in opposition to the facts demonstrated by Hering. Dealing with the mode of origin of motor impulses in the muscular tissue, Engelmann holds that for the followers of the neurogenetic theory there are two possibilities. Either the intracardiac motor ganglion cells are automatically active, or they are secondary to external influences, whether through the blood or the lymph on the one hand, or through intracardiac reflexes by means of cellulipetal nerves. For the upholders of the myogenetic theory who do not recognise the existence of intracardiac musculo-motor nerve centres, the reflex hypothesis falls to the ground. What then are the external influences operative here? Is it the blood stream which, from the days of Haller to those of Goltz, has for many physiologists been the sole stimulus? This is impossible, as the heart beats long after every trace of blood or other nutrient fluid is allowed to approach it. The influence of the lymph between the muscle fibres is also for similar reasons rejected. The only recognised stimulus to contraction is that produced within the muscular elements through tissue changes, in which connection Engelmann cites the investigations of Howell and Loeb upon the reactions of the various ions and the tissues.

The co-ordination of the cardiac movements and the conduction of the motor impulses is attributed by Engelmann to the muscular connections which have in recent years been described; and, to get over the difficulty of the almost instantaneous conduction of impulses through the auricles and through the ventricles while a comparatively long time elapses between their respective contractions, Engelmann ascribes with Gaskell a more restricted and embryonic power of conduction of motor stimuli to the muscular bridges. He believes the facts of artificial stimulation in different parts of the heart show that the conduction may be reversed, and he regards this as being highly antagonistic to any theory based upon nerve conduction. Again, he points to the rapidity with which motor impulses pass through the heart, which is much less than in the ordinary motor and sensory nerves. From all these facts he holds that the theory of neurogenetic conduction and co-ordination is no longer tenable, and he therefore concludes as follows:

"So stellt sich uns denn das Herz dar als ein Muskel, der ohne Mitwirkung von Nerven und Ganglien nicht nur sich selbst erregt, sondern der auch die Succession und Koordination der Bewegungen seiner einzelnen Abteilungen ohne Mithilfe intracardialer Nervenelemente in zweckmässiger, die peristaltische Fortbewegung des Blutes veranlassander Weise auf rein myogenem Wege zustande bringt."

Engelmann goes on to claim the law of maximal contraction, enunciated by Bowditch, as an argument in favour of myogenesis, and to appropriate the refractory period, discovered by Marey, as a further proof. Here, however, to the philosophic mind, both these phenomena are as easily explained by the one theory as the other. With regard to the relationship of the nerves and the cardiac functions, he does not agree with Hensen in his interpretation of his careful microscopic observations, yet he waxes somewhat angry over the charge sometimes brought against the myogenetic theory, that it takes no account of the influence of the nervous system, and particularly of the nerves of the heart. He claims that the theory throws unexpected light upon the rôles of these nerves, and proceeds to say:

"Freilich—und dies muss als Grundlage aller heutigen Anschauungen und aller weiteren Betrachtungen über die Innervation des Herzens festgehalten werden — motorische Ganglienzellen und motorische Nervenfasern im gewöhnlichen Sinne des Wortes besitzt, wie wir oben sahen, das Herz nicht, weder in seiner Wand, noch ausserhalb. Die Ganglien und Nerven werden somit nur, und die Erfahrung bestätigt das, die selbständige Tätigkeit der Herzmuskeln zu modifizieren, zu heben oder zu hemmen, imstande sein. Aber auch hiermit bleibt, wie wir alsbald näher sehen werden, den Herznerven eine reiche Fülle wichtiger Aufgaben zuerteilt."

In his final description of the influence of these nerves, one cannot but be struck by the fact that he is in antagonism to other distinguished adherents of the same school, since he, in stating the functions of the intracardiac ganglion cells, expresses the view that they are mainly inhibitory, whereas His and Romberg say, "Die Herzganglien sind rein sensibel." In other words, the opinions of some of the myogenetic leaders cancel each other. The idea has more than once occurred to my mind that certain of the more ardent myogenesists feel themselves in much the same case as some of the rigidly orthodox in theology when face to face with the early discoveries of geology. It may be remembered that when hard put to it to explain the presence of ever higher forms of life in the newer strata, these disputants expressed the notion that the devil had placed the fossils in the rocks to be a snare for the children of men.

The arguments derived from the recent studies of the connections between the vein and the auricle, as well as those between the auricle and the ventricle, together with the wonderful ramifications of the Purkinje fibres, which we owe to the indefatigable researches of Gaskell, Kent, His, Ewald, Retzer, Braeunig, Tawara, and Keith, as well as the experimental researches upon the auriculo-ventricular bundle by His, Humblet, Erlanger, von Tabora, and Erlanger and Hirschfelder, have often been claimed as strong evidence in favour of the myogenetic theory. The same is true of the striking features of heart-block studied from the clinical point of view by a great army of physicians, and of the pathological investigation of morbid changes in the auriculo-ventricular bundle which have been described by Stengel, myself, Schmoll, Jellick, Cooper, and Ophüls, and Keith and Millar. But it has to be remembered that even the auriculo-ventricular bundle contains not only nerve fibres, but ganglia as well, as has been shown by Tchermak, Tawara, and Keith. That the conduction is by muscle cannot as yet be held as proved. Indeed, the interesting facts that stimulation of the vagus has an effect upon the conductivity of the auriculo-ventricular bundle, as observed by Knoll after the administration of helleborein, and by Cushny and Mackenzie after the employment of digitalin, seems to my mind an argument pointing all the other way. The further observation that the act of deglutition in a patient with impaired conductivity may produce a complete block, as seen by Mackenzie, appears also to me as a strong point in favour of neurogenesis.

It is universally recognised that the seat of the causes of the rhythmic movements lies in the great veins entering the auricular sinus. From the days of Albrecht von Haller to the times of Lauder Brunton, MacWilliam, Engelmann, Hering, Krehl, and Romberg, this fact has been received with general acceptance. But to what particular tissues is the function to be assigned? In one of the most beautiful researches of recent years, Keith and Flack have attempted to answer this question. They describe the musculature of the sinus as being freely continuous with that of the auricular canal and auricle, and in their search for a well-differentiated system of fibres within the sinus, which might serve as a basis for the inception of the cardiac rhythm, they have been led to attach importance to a peculiar musculature surrounding the artery or arterial circle at the sino-auricular junction. The structure is described as being like that of the auriculo-ventricular bundle, consisting of an intimate network of pale undifferentiated fibres with well-marked nuclei. It is to be observed that Keith and Flack describe the presence of nerve cells and nerve fibres, and state that, "although the mass by its connections is undoubtedly muscular, the nerves in the neighbourhood of the vena cava appear to come into very intimate connection with it, so that we feel justified in stating that a highly differentiated neuro-muscular junction occurs at this point."

The occurrence of a block at the sinus, if the interpretation furnished by Hering and Wenckebach, as well as by Ritchie and myself, is correct, seems to me strongly in favour of neurogenetic conduction. The muscle fibres are certainly not so much restricted as in the case of the auriculo-ventricular bundle, according to Keith, and the occurrence of a block at this point is, therefore, more likely to be the result of disturbed nerve influence than of diminished muscular conductivity. This, in fact, is fully recognised by Keith and Flack in the contribution just referred to, which appeared after these remarks had been written. They frankly acknowledge that a sino-auricular block cannot be due to any anatomical lesion of a narrow bridge of fibres, but must arise from the depression, probably of vagal origin, of the muscular tissue. We may well ask, why muscular tissue?

The occurrence of irregularity of the heart in early life seems to me to have an important bearing upon this subject. The long series of careful observations made by Mackenzie have led him to the conclusion that the irregularity of early life is commonly of nervous origin, and his conclusions entirely commend themselves to my judgment. This view necessarily leads to the probability that interference with the heart functions arising in such a way is more likely to be produced through disturbances of the intracardiac nervous system than of the muscular tissues. The irregularities of later life are undoubtedly produced very commonly by structural alterations in the muscular as well as in the nervous tissues, and no argument from them can be deduced; but many of the toxic forms of arhythmia in patients suffering from gouty troubles are, like early irregularity, to be regarded as in favour of the neurogenetic theory.

The action of chemical substances has sometimes been invoked as an argument in favour of the myogenetic theory. It was shown by Biedermann more than five-and-twenty years ago, that the skeletal muscles may show rhythmical contractions under the influence of alterations in the chemical composition of the fluid by which they are surrounded, and more recently Howell and Loeb have demonstrated that certain ions have the faculty of producing such phenomena. Here again, however, it is a mere assumption that such agents act on the purely muscular protoplasm. Seeing that the muscle cell is inextricably interwoven with nerve fibres, and that these nerve fibres, as Carlson has shown, are less subject to destructive changes than the muscle cell, the argument would seem to the unbiassed mind to lie in an entirely opposite direction.

The observations of Magnus and of Sollmann are of considerable importance in their bearing upon the question at issue. They have been able to prove that distension of the coronary arteries is able to start and to maintain the beat of the heart. It seems probable that Sollmann is correct in his conclusions that this fact is in favour of the neurogenetic theory, since it seems likely that the effect of distension is to stimulate the nerves in the walls of the vessels, whence the impulses are conveyed to the ganglia.

It is often stated that the rate of conduction is too slow to be produced by nerve agency; but Carlson has shown that in the intrinsic heart nerves of the king-crab conduction is eight or ten times less than in the peripheral motor nerves. Fully realising that conduction occurs by the auriculo-ventricular band, Carlson will not allow it to be held as proved that the conduction occurs either by muscular or Purkinje fibres. Gaskell's experiments, which showed that the rate of conduction was altered by the action of the extrinsic cardiac nerves, demand necessarily the existence of nervous tissues in the band. Such nervous tissues have been described by Tchermak, Tawara, and Keith, as has already been mentioned.

The analogy between the movements of the heart and of the peristalsis of the intestines has often been urged as a strong argument in favour of the myogenetic theory, on the assumption that the peristalsis is due purely to muscular action. Unfortunately for the views of those who have used this argument, the recent researches of Bayliss and Starling, as well as of Magnus, show that the peristaltic movement of the intestines is due to the plexus of Auerbach. Magnus, indeed, has shown that the wall of the intestine of the cat is refractory at the beginning of automatic contraction, but that this only occurs when the plexus of Auerbach is intact. It is to be remembered that Schultz has not been able to confirm this observation of Magnus, and therefore, before accepting it as having an absolute value, we must wait for some further researches. One most interesting fact has recently been ascertained regarding the peristalsis of the intestine in the embryo by Yanase, who has discovered that this function does not make its appearance until the development of the earliest nervous elements. Yanase concludes from his observations that the automatic movements of the fœtal intestine are neurogenetic in origin. There are undoubtedly some differences between the state of matters here and in the case of the embryonic heart, in so far as the heart beats before any nervous structures are apparent in it, while the first movements of the intestines are synchronous with the earliest development of nervous structures. The facts investigated by Yanase are, nevertheless, a powerful argument in favour of the neurogenesis of cardiac pulsations.

So far we have devoted attention to the observations and opinions in favour of the myogenetic hypothesis. It is time to turn for a space to facts and views which have been recently advanced in favour of the theory of Volkmann.

Observations upon invertebrates, even of lowly types, have been of great assistance in the elucidation of the problems connected with cardiac movements. A very large number of researches have been carried out in this field, of which it is only possible to refer to a limited number, from which most important information has been obtained. Romanes, in his famous Croonian Lecture, showed that in the naked-eyed Medusæ, such as *Sarsia*, excision of the extreme margin of the nectocalyx produced an immediate, total, and permanent paralysis of the entire organ; while, in the covered-eyed Medusæ, such as *Aurelia*, excision of the margin of the gonocalyx brought about the same results. The exact nature of the structures contained in the margin of the nectocalyx and of the gonocalyx was left uncertain by the researches embodied in this contribution of Romanes, but the gap in our information was filled by the investigations of Schäfer. It is important to observe, even so low down in the metazoic scale as the Medusæ, that the textures which, in the higher animals, are generally looked upon as the most highly differentiated, should have already attained a degree of structural complexity and of functional activity scarcely inferior in many respects to the nervous and muscular tissues of the vertebrata. In a most interesting paper, Schäfer gives a clear demonstration of ganglion cells and nerve fibres in the margins of the nectocalyx and of the gonocalyx of the Medusæ.

The valuable researches of Carlson upon the invertebrate heart have thrown a vivid side-light upon the relationship of nerve ganglia and heart muscle. In the king-crab the heart is brought into relation with the central nervous system by means of a median nerve cord, containing ganglia, which is connected with the heart by an arrangement of lateral nerves. Carlson finds that section of the nerve cord produces an independent rhythm of the two ends of the heart, and that removal of the nerve cord causes a standstill of the whole organ. The obvious conclusions drawn from these observations are that the heart-beat in *Limulus* is of purely nervous origin, arising in impulses sent by this cord, and that the cord is a centre, or series of centres, whose rhythmical activity is the direct cause of the heart rhythm. The analogy to the mechanism of respiration is perfectly obvious.

In further researches upon *Limulus*, Carlson finds that the ganglia are more numerous at the end of the heart corresponding to the venous sinus of the vertebrate, and, further, that these ganglia are arranged much after the plan seen in the vertebrate heart. The ganglion cells, which are dotted over the heart of the vertebrate, are probably like the ganglion cells of the lower respiratory centres in the cord, in respect of being only active in response to impulses from centres of greater automatism. The nerves from the nerve cord to the heart muscle are of the ordinary motor type in *Limulus*, and stimulation of these produces continuous super-maximal or tetanic contractions. Carlson quotes the observations of Stewart in this connection, that stimulation of the sympathetic nerve causes the heart of the frog to beat after it has been brought into the condition of heat standstill. The nerve cord in *Limulus* can act as a reflex centre, and Carlson finds that the lateral nerve, when separated and stimulated, gives rise to increased strength of the pulsations, or produces pulsations when the heart is quiescent. In these observations there is reflex augmentation of the pulsating heart, as well as reflex contraction of the heart when at rest. Are these phenomena to be regarded as merely axon-reflexes ? Carlson regards this as unlikely, for the change in rhythm involves every part of the heart whose nerve connections are not severed, while, if they were really axon-reflexes, every muscle cell would require to have an axis cylinder process from every motor neuron, which is hardly to be credited. A rise of pressure in the heart of *Limulus* produces effects only when the nerve cord is intact. It has been stated by Engelmann that a contraction of the quiescent heart muscle on stimulation of any extrinsic or intrinsic nerve would be fatal to the myogenetic theory. The facts advanced by Carlson seem to give food for reflection in this connection.

After fully describing the course of action of the inhibitory and augmentor nerves in the king-crab, Carlson shows that the effects of experiment are similar to those seen in vertebrates. The effect of stimulation of the heart after inhibition is the same as after removal of the nerve cord, and therefore complete inhibition is equivalent to throwing the nerve cord out of action.

The obvious criticism of these interesting researches of Carlson, and indeed of all similar investigations on the invertebrata, is that the invertebrate type of heart cannot be regarded as homologous to that of the vertebrates. The organs undoubtedly differ widely in structure, and exact comparison is therefore impossible; it is, nevertheless, a striking fact that Carlson finds so many points of resemblance in the two types. It may be recalled, moreover, that Wenckebach admits there is no fundamental difference between striped and smooth muscle fibres, or between vertebrate and invertebrate muscle cells.

The investigations of Greene upon the physiology of the Californian hagfish, *Polistotrema*, are decidedly suggestive, and, in particular, his observations upon the caudal heart of the animal are of much value. By these investigations he has been able to prove that the rhythmic contractions of the caudal heart are produced by rhythmic discharges of motor impulses which proceed from an automatic caudal heart centre in the spinal cord. To this and similar researches there is always the obvious objection that the organ investigated is not homologous to the mammalian heart. Freely admitting this, the analogy is a far better one than that furnished by a pianola or a horseman!

It has been asserted that in certain of the invertebrate hearts, ganglion cells do not exist, and the cardiac arrangements of *Aplysia* have, in recent years, been often pointed to as proofs of this contention. But more recent investigations have shown that the statements of Straub are not based on solid facts, and we may safely conclude that we do not know anything about the properties of the heart muscle apart from intrinsic nervous tissue and ganglion cells.

Schwartz has seen numerous cells along the nerve fibres and vessels of the ventricle, but expresses a doubt as to their nervous nature, from the fact that they possess no nucleated envelopes. As is very well known, the cells in the plexuses of Auerbach and Meissner, where the nature of the cells is undoubted, possess no nucleated envelopes.

In a valuable paper on the volume curve of the ventricles of the mammalian heart, Yandell Henderson applies his results to the elucidation of the properties of cardiac muscle, the functions of the nerve net, and the nature of vagus influence. He is constrained to express his opinion that the behaviour of the mammalian heart is not so easily explained by the ever-increasing complexity of the myogenetic, as by the simpler principles embodied in the neurogenetic hypothesis. He holds that the distinction between the two hypotheses lies in the acceptance or rejection of the idea that the processes which generate the stimulus are distinct from those which react to it, as well as in the acceptance or rejection of the view that the influence of the vagus is not primarily exerted on cardiac muscle, but on the stimulating mechanism contained in the cardiac plexus. He regards the reduced rate of the heart-beat as a lengthening of the periods between the stimuli, and standstill as a phase during which the muscle fibres receive no stimuli; in urging which he gives good reasons for rejecting the views of Stephani, Gaskell, and Engelmann. That the vagus actively causes an increase in cardiac volume, as asserted by Stephani, he disproves. That the vagus promotes anabolic processes, as urged by Gaskell, he shows to be improbable, for the ventricle behaves exactly as the gastrocnemius does when the stimuli are instantaneous and maximal—all depends in both cases on the rate at which stimuli are applied. He further rejects the view of Gaskell that the vagus acts directly upon muscle, modifying the five functions he has described, and also the still more complex hypothesis of Engelmann, that the vagus has different sets of fibres for the different functions, chronotropic, bathmotropic, dromotropic, and inotropic, which that observer ascribes to the heart of the frog.

Henderson finds from his own experiments that the volume curves obtained from the mammalian heart also show changes in rhythmicity, conductivity, excitability, contractility, and tonicity. He strongly urges, however, that these phenomena are easily explained on the neurogenetic hypothesis, if we only claim for the heart such properties as are possessed by a striped muscle. The processes in the nerve net result in discharges of stimuli into the muscle, similar to those which in the case of ordinary muscle produce similar behaviour. Hence we may infer the properties of the cardiac plexus. The first conclusion to which this line of reasoning leads him is that the plexus normally discharges only maximal stimuli, for every contraction is maximal; and since tonus at every instant is proportional to the number of beats in the period immediately preceding, there must be an entire absence of those subminimal stimuli which induce tone in a resting skeletal muscle. The statement that the plexus of the mammalian heart normally discharges only maximal stimuli, does not mean that the plexus is essentially incapable of submaximal discharges. On the contrary, when the mammalian heart ceases to beat vigorously with complete co-ordination and uniform rhythm, its volume curve may exhibit a wide diversity of forms. Such curves resemble the contraction curves of striated muscle induced by stimuli of irregular series and submaximal strength, and may be explained accordingly as due to irregular and submaximal discharges by the cardiac plexus. Regarded thus they strengthen the view that cardiac muscle is merely a somewhat modified variety of striated muscle, and that the behaviour of each is equally the expression of the stimuli discharged into its fibres through nervous channels. The essential difference in the behaviour of the heart and that of a skeletal muscle in the living body lies in this—that the contractions of the latter usually occur under the influence of a very rapid series of submaximal stimuli. The beat of the heart, on the contrary, is induced by a single and nearly instantaneous stimulation.

"To the cardiac plexus," Henderson says, "we must accordingly assign the property of effecting a continual algebraic summation of various stimuli, chemical (such as oxygen, the Na, K, and Ca ions, etc.), mechanical (from the coronary and venous pressures), and nervous (from vagi and accelerators), in such a manner that the excited state of each unit of the plexus is not discharged into the muscle until it has swollen to the proportion of a maximal stimulus. Indeed, by utilising the modern view of the properties of the synapse, we may explain the all or none character of the heart-beat by assuming that, as compared with the interneuronic connections in the central nervous system, the junctions of the nerve units composing the cardiac plexus are of high resistance. Normally they yield no passage to any excitation of an intensity less than that which will induce a maximal contraction in the cardiac muscle. When, however, the pressure of excitation becomes sufficient to break through the junction, the passage is wholly free and complete.

"Furthermore, the entire range of vagus influence appears to be explainable on this view by the assumption that all its fibres belong to a single class, and that their function is to increase, or under uniform normal conditions to assist in maintaining, the resistance of these junctions. This assumption accounts for the immediate results of the section of both vagi previously described. It accounts for the slowing of a normal rhythm without increase of amplitude of beat; for while under such conditions the excitations must be dammed back to a supermaximal intensity, supermaximal stimuli can induce in muscle only maximal contraction. It accounts for the increased amplitude which accompanies slowing, when the functional activity of the plexus is below normal and its discharges are therefore submaximal. Finally, it accounts for the variations induced by vagus stimulation in rhythmicity, excitability, and conductivity."

The phenomena of inhibition by means of the vagus provide matter for reflection. MacWilliam has pointed out that whatever may be taking place in the nerve cells, on vagus inhibition there is a profound change in the muscle. This is shown most decisively in certain hearts in which (as in the eel and the newt) the vagus acts very powerfully. In these hearts the cardiac muscle becomes absolutely inexcitable by such direct stimuli as powerful induction shocks and mechanical irritants. These facts are held to show muscular inhibition, for mere inhibition of nerve cells could not prevent the response of the muscle when directly excited. But what of the nerve fibres?

In a recent contribution, Hering shows that the fact of many contractile parts of the supra-ventricular region of the heart being destitute of automatic properties is not in favour of myogenesis. He further points out that some additional factor must be at work. If we accept a nervous automatism he thinks we shall require some additional hypothesis, that is, if we ascribe automatism to nerve fibres, since they are found everywhere. But in the case of the ganglion cells the matter stands differently, as they vary in their distribution, and he points out from his experiments, compared with the researches of Krehl and Romberg, that those parts which he found destitute of automatism have no trace of ganglion cells. He shows that some of the difficulties connected with the neurogenetic theory are met by the fact that there are different kinds of ganglion cells with various functions, which cannot be urged of muscle cells.

An important argument against myogenesis is to be derived from the fact that the heart may conduct impulses without manifesting contraction. Fredericq observed that the apex of the heart might be electro-negative to the base, or, in other words, that it contracted before the base. Waller and Reid found that the apex may either precede or follow the base in the manifestation of electro-negativity. Bayliss and Starling, on the other hand, found that in health the base always manifested electro-negative conditions before the apex, but that in hearts which had been damaged the apex might precede the base. Some light upon this subject has been thrown by the researches of Carlson on *Limulus*. He finds that the heart walls may conduct impulses without showing contraction. After soaking the heart until the condition of water-rigor appears, it is clear that the nerves can withstand the evil effects of the process better than the muscle cells, and, after inducing that condition in *Limulus*, he is able to prove that the conduction does not take place by muscle but by nerve. He observes that analogous effects may be produced by heat, and that after its application the muscle fails to respond, while the ganglion cells are still active.

Amongst the opponents of the myogenetic theory, von Cyon stands prominently forward as one of the most formidable in destructive criticism. In his famous paper, "Myogen oder Neurogen," he furnishes one of the most acute examples of physiological polemics which our generation has witnessed. To this has more recently been added his work on the nerves of the heart, which also abounds in trenchant criticism. On this occasion it is impossible to follow the author through his analysis of the myogenetic hypothesis, but it may be said in a word that his opinion is strongly in favour of the views of Volkmann and his followers.

My pleasant duty is nearly accomplished. Will you permit me to express the hope that the lengthy examination of the doctrines necessary for their clear apprehension has not been intolerably wearisome? When turning the subject over in my thoughts lately for the purpose of addressing you this evening, the quaint remarks of Burton on excessive mental effort as a cause of melancholy recurred to my mind. "No labour in the world," he says, "like unto study."

The conclusion of the whole matter, so far as can be seen at present, lies in a question of probabilities. Five years ago my adhesion was almost given to the myogenetic hypothesis, but much clinical observation and considerable pathological investigation, as well as laborious study and critical analysis of all the important contributions upon the subject, have led me to the conclusion that the view of Volkmann still furnishes a nearer approach to a satisfactory explanation of the facts than any other which has since been advanced. In the remarks which have been made, a running commentary upon the various views has been offered in connection with each of them, and it has been my earnest effort in doing this to remain as free from personal predilection as is possible for ordinary human nature.

To summarise the arguments, let me state succinctly the various points which have been under review. The embryological facts cannot be claimed by the adherents either of myogenesis or of neurogenesis, for the heart begins to beat before muscle or nerve appears. The anatomical conditions do not favour one or other hypothesis, for nerve and muscle are closely interwoven in the region where the pulsation is initiated. The physiological evidence is equally claimed by the upholders of both views, and structural considerations show that both have much weight on their respective sides. The pathological results are equally impartial in their bearing, and prove neither opinion. The clinical observations, however, are distinctly easier to explain on a neurogenetic basis. Beyond all doubt the singular structure recently described by Keith and Flack is the mechanism by means of which pulsation is initiated, but the original impulse to my mind is clearly given by the nervous elements.

Dealing with matters of such intricacy and complexity, it must be frankly confessed that such proof as will satisfy the demands of a rational scepticism is still far from attainment. It is, indeed, difficult to see at the present moment whence such evidence is to be obtained. Out of the patient investigations and indefatigable researches of so many observers it is to be hoped that a means of arriving at the truth must come at last. Meantime, as has been already said, the whole matter is a question of probabilities. In default of absolute proof we must be guided by the weight of evidence and by the inherent acceptability of any explanation. The simplicity of the neurogenetic as compared with the complexity of the myogenetic hypothesis pleads eloquently for the former. Any view invoking the necessity of a dual control must necessarily be less worthy of adoption than another demanding only a single agency; as Newton says: "Natura suim simplex est, et rerum causis superfluis non luxuriat." "That man is always happy," says Ruskin, "who is in the presence of something which he cannot know to the full, which he is going on to know." In the conflicting statements and discordant opinions arising out of the consideration of this central point of circulatory physiology, we assuredly ought to be happy!

"Causa latet, vis est notissima fontis" seems to me singularly applicable to the points at issue, and, reviewing the whole circumstances, many of us will probably be inclined to agree with our late Laureate that, as regards the subject under discussion,

"We have but faith: we cannot know;
For knowledge is of things we see."

THE DIFFERENTIATION OF PARTIAL FROM TOTAL TRANSVERSE LESIONS OF THE SPINAL CORD.

By ALEXIS THOMSON, F.R.C.S., *Surgeon to the Deaconess Hospital, Edinburgh.*

THERE is no department of surgery in which the records of carefully observed cases are of more value than in injuries of the spinal cord, and it is impossible to read such works as those of Thorburn[1] and of Kocher[2] without realising how much these authors were dependent upon the accurate records of clinical cases for the important contributions which they were able to make, not only to the surgery but also to the physiology of the spinal cord.

Kocher, with that touch of dry humour which characterises his writings, remarks that in order to study spinal injuries one should live in a district where the gathering of fruit from trees is a staple industry, as abundant clinical material is thereby provided. I am confident, however, that any one of our large hospitals could supply material, which, if properly recorded, would prove of very great value, and I would throw out the suggestion to those in charge of Incurable and Workhouse infirmaries, to which so many spinal cases are ultimately admitted, that a chapter on the final stages of such cases as come under their care would add a great deal to our knowledge, especially in the domain of prognosis.

My own experience of injuries of the spine is comparatively limited, but I shall place on record certain cases which have been under my observation for a sufficient length of time to allow of conclusions being drawn as to the nature of the injury to the cord and the clinical features associated therewith, with a reasonable approach to that accuracy which can only be obtained by post-mortem examination, and I am also anxious to ventilate certain practical questions, especially that upon which reliance is to be placed in the diagnosis of total from partial lesions of the cord, as upon this mainly hangs the all-important question, whether the patient is to get better or not, and if he is to get better, to what extent will the cord recover its functions?

In *total tranverse lesions* every function of the cord below the site of injury is immediately and permanently arrested.

The paralysed limbs become at once flaccid; the muscles waste rapidly, and their faradic excitability lessens, rapidly at first, then more slowly, and finally it may be lost; the muscular wasting affects all the voluntary muscles below the lesion equally.

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[1] "Surgery of the Spinal Cord," London, 1889.

[2] "Die Verletzungen der Wirbelsäule," *Mitth. a. d. Grenzgebiet. d. Med. u. Chir.*, Jena, 1896, Bd. i. Heft 4.

The motor and sensory paralyses correspond in extent with abrogation of the functions of the cord at a perfectly defined level, and they are the same on the two sides of the body, with only such minor differences as may be due to the transverse lesion not being absolutely horizontal.

The only sign of self-action remaining in the isolated part of the cord is the occasional presence of the skin reflexes in much reduced degree.

Above the upper limit of the sensory paralysis there is a zone where sensation is not quite abolished, and above this again a zone of hyperæsthesia.

Without exception there is complete paralysis of the bladder and rectum. In the first few days following the lesion the sphincters still retain their tone, and retention is the prominent feature, but, as the sphincter tone lessens, as a result of isolation of the lumbo-sacral region from the higher centres above, the orifices become relaxed and incontinence supervenes.

Corresponding in extent to the motor paralysis there is paralysis also of the vaso-constrictor fibres, with dilatation of the subcutaneous venous network, and not infrequently local elevation of temperature. In lesions high up in the cord in young men, the vasomotor paralysis may result in priapism, the penis becoming turgid from the distension of the corpora cavernosa with blood. While Kocher would lead one to infer that he associates priapism with total lesions, I am inclined to the view that its presence is quite compatible with a partial lesion.

Great stress is to be laid on the condition of the deep reflexes, and especially of the *tendon reflexes*, which in total tranverse lesions are completely abolished in the area of paralysis, whereas in partial lesions, even if they are abolished at the outset, they return and frequently show exaggeration. The return of the deep reflexes at any subsequent period is significant that the lesion has not remained total, and that conductivity through the region of the lesion has again become possible, either from recovery of elements of which the function has been in abeyance for some time and has been resumed, or the taking over of their functions by undamaged fibres. The view that the return of the reflexes may be due to the regeneration of nerve fibres, which has been repeatedly advanced, can no longer be entertained.

It has been pointed out by James Collier[1] that "when the knee-jerks have disappeared in total tranverse lesions, for a certain time after such disappearance the knee-jerks may be again obtained subsequent to long-continued faradisation of the lower limbs." This observation he regards as proving that the loss of the knee-jerks is due to isolation from the higher centres, and not to any concomitant injury to, or consecutive structural changes in, the lumbo-sacral centres. He also draws attention to the fact that

[1] *Brain*, London, 1904, vol. xxvii.

the disappearance of the knee-jerks is not absolutely synchronous with the occurrence of the lesion, since they have been repeatedly obtained in decapitated criminals, and have been noticed to persist as long as ninety seconds after execution.

We are in entire agreement with those who hold that the return of the knee-jerks after a lapse of time affords convincing proof that the lesion is a partial one, and that the cases which have been published as examples of total lesions with persistent knee-jerks are really instances of partial lesions.

Quite a number of authors have maintained that the return of the knee-jerks in a total lesion is due to regeneration of certain of the conducting paths in the cord, and these same authors believe that regeneration of nerve fibres in the spinal cord is an established fact.

A great deal of experimental and a lesser amount of clinical evidence has been adduced in support of this belief in the capacity for regeneration of the nerve elements of the cord. So recently as 1906, Marinesco[1] was able to demonstrate an effort at the regeneration of nerve fibres from the proximal side of the lesion, but the embryonic axones penetrated only for a short distance into the newly formed connective tissue and then ceased. Inasmuch as the spinal axones have no neurilemma—the essential element for the formation of new nerve fibres—it must be concluded that functional reproduction is impossible.

The clinical evidence in support of the regeneration theory is even less convincing than the experimental; the occasional recovery of functions after their total loss is capable of being explained in various ways. Fibres which have been only temporarily thrown out of gear as the result of pressure or œdema may recover, or the function of those which have been destroyed may be taken over by other fibres which have remained intact. It would appear to be certain that pressure may produce complete physiological abrogation of function for many days without there being necessarily destruction of the nerve elements, and in the case of the bladder and rectum it has been proved, as the result of observation of hemi-lesions of the cord, that the fibres of one side will suffice for the complete restoration of the functions of these organs.

As an illustration of the kind of clinical evidence upon which the capacity of regeneration in the spinal cord is founded, I may quote a case recently recorded by Krauss of Buffalo.[2]

A young man after diving into shallow water became semi-unconscious and devoid of power in the arms and legs. On admission to hospital there was total paralysis of the legs and partial paralysis of the hands and arms, the reflexes were absent, there was retention of urine and marked priapism. The anæsthesia extended up to the second interspace, and was present also on the ulnar aspect of both arms. On the sixth day there developed bedsores and mild cystitis, reflex contractions appeared in the feet and legs, and there were *darting pains in the arms and legs.* In spite of these facts, the diagnosis made was that of *complete* severance of the cord at the level of the sixth cervical vertebra. An operation was performed by Roswell Park, and the cord appeared flattened and diminished in bulk. The knee-jerks returned within a month, and became exaggerated, and improvement in every respect gradually took place, so that he was able to resume his work as a telegraph operator.

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[1] *Semaine méd.*, Paris, 1906, April.

[2] *Ann. Surg.*, St. Louis, 1906, November.

I will give Krauss' opinion of the case in his own words. "There is no doubt that a complete transverse lesion was present, by the appearance of the cord as found by Dr. Park, and by the symptoms up to and following the operation fifteen days after the injury; that a very decided regeneration has taken place with a remarkably excellent result is evidenced by his condition as stated at the present time." Without any desire to be discourteous to Dr. Krauss, it appears to me that any one considering the facts of the case will form the opinion that the case was one of partial injury to the cord, and that there was no evidence whatever of regeneration of nerve fibres.

Many similar cases might be quoted of partial lesions which were assumed to be total, with the result that erroneous inferences have been drawn as to the functions of the spinal cord.

When there is recovery from an apparent total transverse lesion, the first sign of such recovery is the return of the knee-jerks and a gradual change in the limbs from the flaccid to the spastic condition. Sensibility returns in the order—touch, pain, temperature,—and the parts supplied by the lowest sacral segments usually become sentient before those supplied from a higher level. Sometimes the first sign of such return is the patient becoming conscious of the act of micturition or of catheterisation or of distension of the bladder during the process of irrigation (Collier).

Voluntary power returns earlier in the flexors than the extensors, and flexion of the toes is almost invariably the earliest voluntary movement possible.

It is important in practice to bear in mind that when one is called to a case of injury to the spine with complete abrogation of all the functions of the cord below the seat of injury, it is impossible to determine whether the abrogation is due to destruction of all the nerve elements—a total transverse lesion—in which case the abrogation will be permanent, and in lesions in the cervical region the patient will not survive more than a few weeks—or, whether there is only partial destruction of the nerve elements with temporary abrogation of the functions of those which remain as a result of pressure by bone, extravasated blood, or œdema. The only means available for immediate differentiation would be an operation consisting in exposure of the cord, and the demonstration that it was completely torn across. In the great majority of cases this is inadmissible, and we have to satisfy ourselves with observing the progress of the case. According to Kocher, one has not long to wait before the question is cleared up, as, in his experience, if the lesion is a partial one, the deep reflexes return within a few days of the injury. On the other hand, cases are reported in which the return of the knee-jerks has been delayed for a month or six weeks.

I shall now report the cases which have been under my own observation.

CASE 1.—*A lesion limited to the first dorsal segment of the cord, being the report of a case in which this segment appeared to be completely destroyed, but in which the survival and partial recovery of the patient showed the lesion to have been largely due to extravasation of blood into the substance of the cord.*—The patient, a coachman, æt. 29, was seen at Hawick Cottage Hospital, 13th October 1905, in consultation with Dr. Hamilton of Hawick and Dr. Brown of Denholm. Two days before he had been thrown from the box of a runaway landau, and had been found lying on his face quite motionless, the head being flexed forwards on his chest, and bleeding freely from a scalp wound. He was sufficiently conscious to express concern about the horse.

When seen by Dr. Brown, he was lying on his back, and did not show any characteristic attitude; he complained of pain in the lower part of the neck and along the right arm, but had no sensation in his lower limbs, and, on touching his abdomen, he asked if he were touching his own body, as he could not feel it. Motion and sensation were completely abolished below the third rib; the breathing was laboured and purely abdominal in type. The pulse was 72; the pupils were markedly contracted. The scalp wound was in the upper occipital region, a little to the left of the middle line; it extended down to the bone, where there was a small fissured fracture. He was removed by special train to the Hawick Cottage Hospital, where he received every attention.

On the following day his condition was much the same, except that he complained a good deal of pain in the neck, and this was greatly aggravated by the slightest movement. The pulse had risen to 88 and the temperature to 103° F.

I saw him on the following day (13th October 1905) along with Drs. Brown and Hamilton. Sensation was abolished as high as the upper border of the third rib. The patient, however, maintained that he was able to feel when the three outer toes of the left foot were pinched. In the arms there was anæsthesia in the area of distribution of the ulnar nerve, this being more decided on the right side. There was complete motor paralysis of the lower limbs and of the muscles of the trunk as high as the upper border of the third rib, while in the upper limbs there was apparently complete paralysis of all the small muscles of the hand and fingers supplied by the median and ulnar nerves. (Fig. 1.)

There was complete paralysis of the cervical sympathetic on both sides; the pupils being markedly contracted, the eyeballs softer and receded in their sockets, and the palpebral fissures decidedly narrowed.

The breathing was of the purely diaphragmatic type, with widening of the lower part of the chest and vaulting of the abdomen on inspiration, without any participation of the other respiratory muscles except those of the neck.

There was retention of urine, necessitating the use of the catheter; the bowels had moved involuntarily and without his knowledge, and there was marked turgescence of the corpora cavernosa.

There was great tenderness on pressure over the lower cervical spine, but no irregularity could be discovered. There was no evidence of fracture of the sternum.

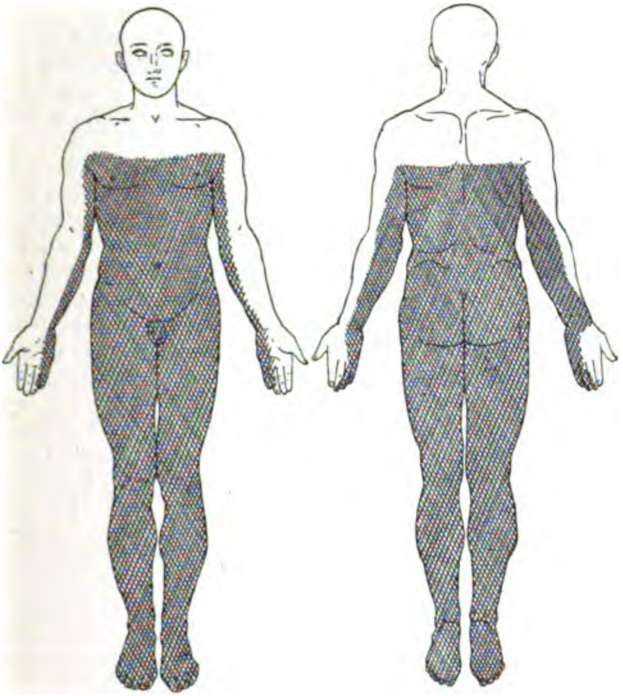

FIG. 1.—J. J., æt. 29. Partial lesion of first dorsal segment. Anæsthesia of trunk to upper border of third rib. Anæsthesia of ulnar aspect of hand, forearm, and upper arm. Paralysis of motion of trunk and lower limbs and muscles of hands. Paralysis of cervical sympathetic on both sides. Loss of knee-jerks and plantar reflexes. Incontinence of urine and fæces. Bedsore.

The suggestion that the symptoms were due to hæmorrhage around and pressure on the cord was not entertained, because the paralysis had existed from the outset. The completeness of the paralysis and its exact correspondence to a total transverse lesion of the first dorsal segment led us to the conclusion that the cord had been completely destroyed at this level, and, as a logical outcome of this, the opinion expressed was that, in view of the impairment of respiration, he was unlikely to live for more than a month. The only feature which was considered as throwing any doubt on this opinion was the alleged sensation in the three outer toes of the left foot; we believed it to be so improbable that the fibres distributed to the three outer left toes could alone of all the conducting fibres in the cord have retained their function, that the patient's statement on this point was disregarded.

The usual measures were adopted to place the neck at rest over a roller pillow, and to prevent bedsores and infection of the bladder.

During the next few days he was restless, suffering from a good deal of pain in the neck, from inability to cough or blow his nose, and there developed some dulness over the base of the lungs posteriorly with crepitations. The slightest movement of the neck in raising the head to have the scalp wound dressed caused great pain.

The next report from Dr. Brown, five weeks after the accident, recorded that the breathing was still purely diaphragmatic; the line of anæsthesia in the trunk was at the same level as before. There was some return of power in the muscles of the left hand, so that he was able to grasp objects. Sensation to touch had returned in some parts of the left leg, and he can localise the spot touched. There is now a distinct plantar reflex on both sides, and he can move the toes of the left foot and the foot itself slightly. He cannot appreciate the difference between hot and cold sensations. The left pupil is now distinctly dilated as compared with the right. The skin of the trunk and limbs is now dry and hard, and over the dorsum of the foot presents a glistening and stretched appearance; the priapism has disappeared, and the urine, which dribbles away constantly, contains a considerable amount of pus.

These observations show that there has been a considerable recovery of the conducting functions of the cord at the seat of the injury, the recovery being distinctly greater on the left side, proving conclusively that, contrary to the first opinion, the lesion was a partial instead of a total one, that the original loss of function was probably to a large extent the result of hæmorrhage into the substance of the cord—hæmato-myelia —and that the nuclei of origin of the median and ulnar nerves situated in the first dorsal segment had probably been partially destroyed by the hæmorrhage, the conducting fibres to the trunk and lower limbs had to a large extent escaped destruction, their functions being abrogated in the first instance by pressure due to the extravasated blood. Inasmuch as recovery of function to the extent described had taken place within a period of five weeks, the opinion was expressed that further recovery would take place probably to an extent that would enable the patient to regain the use of his lower limbs, at any rate to a partial extent.

The improvement above recorded continued, and four months after the accident Dr. Brown reported as follows: "The patient is now able to sit up in bed with the support of a rest for an hour or two daily; a large bedsore which had formed over the sacrum is now nearly healed; the breathing is still entirely abdominal; he has regained some control over the bladder, and knows when it is full; he can pull up the left leg quite freely, the right leg not so freely; sensation in the lower limbs has greatly improved. He has recently had a feeling of numbness in the fingers of the left hand, and difficulty in holding the fork when eating; the right hand has improved to the extent that he can write a letter with a thick penholder."

Nine months after the accident (12th July 1906) he was discharged from the hospital. "The bladder functions were normal, except that the call to micturition was sudden, and occurred also about twice during the night; the bowels moved with the assistance of medicine, almost complete control having been regained. He was able to stand and walk a few steps with the help of someone on either side of him."

Three months later (18th October 1906): "Since the last note the most obvious change in his condition has been the gradual increase of a spastic condition, which is most marked in the right lower extremity, with marked ankle-clonus and exaggeration of the knee-jerk. He is now able to walk with the assistance of two sticks."

I saw him a week later, and admitted him to the Deaconess Hospital. His condition was now an interesting one, the most striking features being a spastic condition of the lower extremities most marked on the right side, and disordered sensibility most marked on the left, indicating that the chief stress of the lesion had fallen on the right half of the cord. There was ankle-clonus and exaggeration of the knee-jerks on both sides. On tickling the sole of the foot, the great toe is markedly dorsiflexed. There is general rigidity of the right lower limb, but with a little persistence the hip and knee-joints can be flexed to a right angle, when the rigidity entirely disappears. The foot is in the equinus position, but can with some force be brought to a right angle. There is much less rigidity in the left leg. In walking he rests both feet on the balls of the toes, and kicks out the foot with each step, especially on the right side. The hamstrings on the right side are paralysed, so that he is almost unable to flex the knee-joint.

On testing the sensory functions of the trunk and lower limbs with the light touch of a hair pencil, he feels much more accurately on the right side than on the left, and the same applies to sensibility to pain. Sensibility to heat and cold is impaired on both sides, but more so on the left, and the impairment is more marked on the legs than on the trunk. The pressure sense is normal.

The cremasteric reflex is present, the epigastric is absent. The left pupil is moderately dilated, while the right is usually contracted.

In the arms sensibility to touch is intact on both sides, but there is loss of sensibility to pain in the distribution of the ulnar nerve on the left side. With regard to the power in the hands, this still continues to improve, but the flexion and extension movements of the thumb and index are still imperfect on both sides.

An X-ray photograph of the neck was taken by Dr. Dawson Turner, but did not show any recognisable alteration in the contour of the lower cervical vertebræ.

On the 28th November 1906, I lengthened the tendo Achillis on the right side about 1¼ in., in order to correct the equinus attitude, and in the hope of diminishing the spastic condition of the limb as a whole, with the result that two months later his capacity for walking was greatly improved.

On the 3rd April 1907, I received a letter from the patient, saying that he is a good deal stronger on his legs, and he is improving in walking. The right leg is very stiff, especially at the knee, and although he can walk about the house with a stick, he requires two out of doors. The back is very stiff, especially up the right side and across the small of the back. On rising from bed in the morning he has to take hold of something to straighten himself. About a week ago he walked out about a mile and back again, but was tired after it. The right hand is stronger than it was, but not so strong as the left, and the index of the right hand when cold is of very little use.

It may be reasonably maintained that at the outset the evidence pointed unmistakably to a complete lesion at the level of the first dorsal segment. It will have been noted that there was absolute paralysis of motion and sensation and loss of the reflexes below the second interspace, paralysis of the oculo-pupillary fibres, paralysis of the muscles of the hands, and loss of sensation in the distribution of the ulnar nerve on both sides; the extent of the ultimate recovery of function, however, showed that only a few of the motor nerve cells of the cord and a limited number of the conducting nerve fibres had actually suffered destruction.

So far as I have been able to discover, there is no record of a similar case in which the functions of the cord were so suddenly and completely abolished by a lesion at this level, in which the ultimate result proved to be not only compatible with life, but also with recovery to a large extent of the functions which had been lost.

In injuries to the cord which do not terminate fatally, it is impossible to establish with any approach to certainty the exact nature of the lesion sustained; it would appear that in a case such as that above recorded the cord was momentarily squeezed or contused as a result of acute flexion and torsion of the neck, with or without temporary displacement of one of the vertebræ. Blood was immediately extravasated, chiefly into the grey matter and central canal, destroying a limited number of the nerve elements, and causing compression of all the conducting fibres. There was probably also stagnation of the lymph stream, with more or less œdema, and possibly a certain amount of what Enderlen calls "liquefaction" of the tissue elements. All these factors doubtless contributed to the abrogation of function at the seat of the lesion, and it will be observed that all of them, excepting only the actual destruction of nerve elements, are capable of being recovered from.

It is probable that if the diagnosis of a partial lesion had been made, an operation would have been performed,—with what result it is impossible to say,—but if he had survived, it is more than likely that the remarkable recovery of function would have been placed to its credit.

The practical lessons to be drawn from the case are, firstly, that, given the abrogation of all the functions of the cord, one must not allow oneself to be committed to the diagnosis of a total lesion until a period of some five or six weeks has elapsed since the accident; and, secondly, to decline operative interference unless there is reliable evidence that there is pressure upon a cord which is not irreparably damaged, and that the cause of the pressure can be removed by operation. To be of service, the operation must be performed within seven days of the occurrence of the lesion.

In the following case it was possible on the third day after the accident to negative a total lesion. The operation for exposing the cord, performed three months later, was undertaken as a *dernier resort*, and did not influence in any way the progress of events.

The chief interest in the case lies in the continuance, in spite of complete paraplegia, of an enviable condition of general health, and in the recovery of an almost normal, though purely reflex, action of the bladder centre. The former dictum that such cases finally succumb to urinary septicæmia may be allowed to disappear from our text-books.

The influence of lesions of the spinal cord on the menstrual functions has, so far as I am aware, not attracted the attention of clinicians, probably because women are so much less frequently the subject of severe injuries of the spine than are men. In the present case, menstruation ceased for eleven months after the accident, and then became regular.

Case 2.—*Fracture dislocation of the dorsal spine, with incomplete crushing of the fifth dorsal segment of the cord; laminectomy three months later; persistent paraplegia.*—Mrs. A., æt. 35, seen with Dr. Melville Dunlop on the 13th October 1903. The patient, a perfectly healthy woman and the mother of several children, was cycling along a road two months previously, when she was precipitated over a grass bank 3 ft. in height, landing on her head, and the trunk bending over acutely as she fell to the ground. She was perfectly conscious, and recognised at once that she was paralysed from the lower chest downwards. A plaster of Paris jacket was applied to enable her to be transported to her home, which was at a considerable distance.

Three weeks after the accident the left lower extremity became the seat of a diffuse solid œdema, the result of thrombosis of the common femoral vein.

At first there had been retention of urine, necessitating the use of a catheter three times in the twenty-four hours, but latterly there has been incontinence. Since the third day after the accident there have been spasmodic movements in the right leg, and these have become more frequent and more easily excited, and she could move the toes of the right foot; there has also been occasional formication and tingling in the left leg. There is now complete paralysis of voluntary movement from the costal margin, with the exception of slight capacity of moving the right great toe. There is loss of sensibility to touch, pain, and temperature as high as the level of the costal margin; the upper limit of the cutaneous anæsthesia is horizontal, but varies a little in level from time to time. The skin reflexes, both plantar and abdominal, are present; the patellar reflex is present, and slightly exaggerated on the right side; it was not elicited on the left, because one was afraid to move the limb on account of the femoral thrombosis; there is slight ankle-clonus on both sides. There is a marked kyphotic projection of the fifth dorsal spine, with lateral displacement in opposite directions of the fourth and fifth vertebræ, and the ribs on the right side project posteriorly as in a scoliosis. An X-ray photograph taken on the 4th October 1903 showed that there was lateral and over-riding displacement at the junction of the fourth and fifth dorsal vertebræ, the upper segment being displaced downwards, forwards, and to the left. A bedsore had formed over the right buttock. The urine usually contained pus, and was offensively ammoniacal, although from time to time it would remain clear for two or three days.

On the 2nd October 1903 she was seen in consultation by Dr. Alexander Bruce, who expressed the opinion that the cord was incompletely crushed, and that improvement might be looked for.

On the 13th October 1903 I saw her for the first time, and confirmed the condition of affairs as noted above, except that I could not elicit any knee-jerk or ankle-clonus. I advised against operation, especially in view of the extensive thrombosis in the femoral vein.

On the 24th November 1903 there was a good deal more life in the lower limbs. There was a marked plantar reflex on the right side. Babinski's sign was present in the right great toe; there was exaggeration of the knee-jerks, especially on the right side, marked irritability of the right hamstring muscles, and a tendency for the foot to assume the equinovarus attitude. The cutaneous anæsthesia now extended no higher than the umbilicus, this corresponding to a level 6½ in. below the kyphotic projection. The bedsore had soundly healed, and the urinary sepsis was easily kept in check with urotropine along with acid phosphate of soda, and occasional irrigations of the bladder with a solution of nitrate of silver, one to a thousand.

It was concluded that the cord had not been completely destroyed at the seat of injury. The patient and her family were very anxious that she might have such chance as an operation might afford. This was decided upon and performed on the 30th November 1903, about thirteen weeks after the accident.

Chloroform and oxygen were administered by Dr. Luke, and, the patient having been placed in the semi-prone position, a large flap was raised, exposing the kyphotic projection, and the spines and laminæ of the third, fourth, and fifth dorsal vertebræ were removed piece by piece with strong cutting forceps. One of the articular facets occupied the spinal canal, and when this was removed the dura was exposed and found to be intact; on pressing together the anterior and posterior layers of the dura, some cord substance was felt between them, confirming the opinion that it had not been completely torn across. She made a smooth recovery from the operation.

April 15, 1907.—Her condition was not appreciably altered by the operation one way or another, and the paraplegia has persisted until now, nearly four years after the accident. Her general health remains excellent. She is wheeled out a great deal on to a balcony, and has benefited greatly from this modified form of open-air treatment. She is able to supervise her household, and, although confined to the recumbent posture, may be said to lead a very busy life.

The involuntary jerkings of the limbs, which were very decided before the operation, to the extent of one limb being tossed over the other or over the side of the bed, have, with the exception of a month in 1905, almost ceased, and only take place when the limbs are manipulated for washing and massage purposes. She has an accurate knowledge of the position of the limbs, but the sensory functions are completely abolished, except the sensation of pressure above the knee in both limbs. She cannot voluntarily move the limbs at all, but if she concentrates her attention on one of her feet for a few seconds and then diverts her attention, a jerking movement of the foot usually takes place in the direction of inversion. This is more constantly observed in the right than in the left foot.

The limbs are well nourished, although the muscles are wasted and readily stiffen on handling. She says that when she thinks of her limbs, they stiffen. On scratching the sole of the foot, the great toe is flexed. The knee-jerks are present, and the left one is exaggerated. There is a persistent equinus position of both feet, which prevents the demonstration of ankle-clonus.

It would appear that she can move the abdominal muscles better than was formerly the case. She is absolutely unconscious of the condition of the bladder or lower bowel. There is no incontinence of urine; the bladder empties itself involuntarily at irregular intervals with a good stream, and with the aid of a urine bottle she is kept quite dry. If she is going out anywhere, so that the bottle is not available, the passage of a catheter will keep her dry from six to eight hours. A catheter is also passed at bedtime, so that she may lie on her side during the night.

The urine is perfectly clear, and has an acid reaction. It has only been necessary to give her urotropine on one occasion during the last two and a half years. Massage of the abdomen usually excites the bladder to empty itself.

The bowels are moved twice a week with the aid of medicine, and there is no sensation and no control.

An abscess formed in the bursa over the great trochanter in July 1904, and a sinus has persisted ever since, in spite of its having been opened up on several occasions.

Menstruation stopped for eleven months after the accident, and she was then regular for two years. Since then it has been irregular. Just before the onset of the last two periods there has been a good deal of pain, described by the patient as being in the middle line above the pubes, and as closely resembling in character the initial pains of parturition. These have been relieved by small doses of phenacetine.

ON THE ADMINISTRATION OF GAS AND ETHYL CHLORIDE.[1]

By WILLIAM GUY, F.R.C.S., L.D.S.Ed., *Edinburgh.*

(PLATE I.)

THERE can be in the nature of things but few subjects or occasions on which a dentist may profitably, or without presumption, address the Medico-Chirurgical Society. But I think surgical anæsthesia is a subject on which, from the time of Wells and Morton, dentists, physicians, and surgeons have met on common ground, and have, to the general advantage, described and compared their experiences, hypotheses, researches, and results. I have had for a number of years the opportunity of administering anæsthetics for dental operations at the Royal Infirmary, the Dental Hospital, and in private practice, to a very large number of patients, representing every class, every age, every degree of health, vigour, and intelligence, and suffering from almost every disease and injury. As I have hitherto met with no mishap, nor as yet experienced a moment of anxiety, have never had to use a pair of tongue forceps, or to practise artificial respiration, I may be pardoned if I express some confidence in methods which have served me so well in some 26,000 administrations. The anæsthetic agents I have employed have been nitrous oxide gas, gas and ether in mixture and sequence, soemnoforme, gas and soemnoforme, ethyl chloride, gas and ethyl chloride, and ethyl chloride and ether mixture and sequence. My present practice is to use nitrous oxide gas for all such operations as may be performed in thirty seconds; nitrous oxide and ether mixture for operations requiring from one and a half to three and a half minutes, and gas and ethyl chloride mixture for operations requiring from thirty to ninety seconds. This last class, I find, includes about 90 per cent. of the extraction operations that fall to be performed, and as a consequence the gas and ethyl chloride mixture has come to be the principal anæsthetic in use at the Dental Hospital. I give the figures for the past years—1905, 1614; 1906, 2261; 1907 (five months), 871. My active interest in ethyl chloride and its possible combinations, was, I must confess, first stimulated by the paper and demonstration on soemnoforme, given by Drs. Rolland and Field Robinson of Bordeaux, at the annual general meeting of the British Dental Association in 1902. Those gentlemen soon afterwards demonstrated their methods at the Royal Infirmary and the Dental Hospital in this city, and at several other places in Great Britain. As a consequence of their propagandist pilgrimage, all and sundry, without knowledge or instruction, began to use soemnoforme. The inevitable occurred, the tale of fatalities mounted apace, and soemnoforme fell into general disfavour. But the accidents, I think, were not due to any special lethal property of the drug employed, but to its improper exhibition. I think, further, that Dr. Rolland deserves more credit than he has hitherto obtained in this country. The mixture he used (ethyl chloride, 12 parts; methyl chloride, 7 parts; and ethyl bromide, 1 part) is unstable and expensive, it does not possess any advantages over ethyl chloride alone, but Dr. Rolland's investigations and researches in connection with it were of no small value in stimulating the interest of dentists and anæsthetists in the action of its constituents, and particularly of ethyl chloride. From that time on, I tried all the inhalers' methods and combinations that seemed worthy of trial. In conjunction with Dr. G. W. B. Daniell, I compiled records of results from the administration of—(1) Ethyl chloride, (2) gas and ethyl chloride, (3) soemnoforme, (4) gas and soemnoforme, in each case to 100 patients, and of ethyl chloride and ether to twenty patients. We recorded the sex and age of the patient, the time of induction, the dose of anæsthetic, the available anæsthesia, the number of teeth extracted, the size of the pupil when the face-piece was removed, and the occurrence or absence of phonation, cyanosis, and stertor. Though at the time I was only feeling my way, I found these observations of considerable educational value to myself. At the present time ethyl chloride is rather under a cloud. Fatalities to the number of some twenty-five have attended its use, and the disagreeable after-effects, nausea, vomiting, vertigo, faintness, and headache, which occur to a more or less severe degree in 20 per cent. of cases, have also militated against its employment. The dangers attendant on its use inspired the authorities of the Crown Office to issue a circular to the profession, drawing attention to its perilous properties, and pointing out the comparative safety for dental operations of local anæsthetics. Nevertheless, in the hands of instructed anæsthetists, I think ethyl chloride is eminently safe. Sauvez, the great protagonist of local anæsthesia, in speaking of the dangers of general anæsthesia, refers to the frequent and serious accidents, the blue syncopes from which the patients are only saved by artificial respiration. Such things do undoubtedly happen, but they happen very seldom to an anæsthetist who knows his business. Harvey Hilliard has stated that ethyl chloride is potentially one of the most lethal anæsthetics, and a large number of deaths have been recorded in a very short time. He thinks, however, that it has a wide field of usefulness, though it should not displace nitrous oxide for dental operations. He gives the average dose for an adult as 5 c.c. for twenty to sixty seconds; for a child, 3 c.c. for fifteen to forty seconds. His statement that ethyl chloride kills by paralysing the respiration, when the chest is in a position of over-distension, is certainly true when death is produced by an overdose.

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[1] Read before the Medico-Chirurgical Society, June 5, 1907.

M'Cardie prefers gas, or continuous gas, and condemns the routine use of ethyl chloride for dental operations, because of (1) the less safety, (2) the severity and frequency of after-effects. I myself have given up the use of ethyl chloride by itself, not because of its supposed lethal qualities, but because I found that the mixture of gas and ethyl chloride was in every way superior to ethyl chloride alone. It may be well to pause here to consider these "lethal properties" of which one hears so much. We know that during the induction of chloroform anæsthesia, death may occur at a very early stage and with a very small dose. Death is then caused by cardiac inhibition due to central stimulation. This property of stimulating the cardiac inhibitory centre is also exhibited by ethyl chloride, and this constitutes the first and most important danger of ethyl chloride. Later on in the administrations of either ethyl chloride or chloroform, the dangers may be briefly summed up as—firstly, asphyxia from partial or complete obstruction of respiration; secondly, paralysis of the respiratory centre by an overdose. I believe that the early danger (cardiac inhibition) may be avoided by giving nitrous oxide to the production of a slight degree of narcosis before ethyl chloride is administered, and then adding the ethyl chloride to the gas. As regards the other dangers, the elimination of the asphyxial element is the most important and most frequently neglected of an anæsthetist's duties; while in the case of the anæsthetic mixture I am discussing, the danger of an overdose is prevented by keeping the dose and the time of administration within the ascertained limits of safety. The fact that there is a risk with ethyl chloride alone of cardiac inhibition has led me to abandon the ethyl chloride ether mixture and sequence. Here I differ absolutely from M'Cardie, who holds that as a preliminary to etherisation, ethyl chloride is unequalled, for I infinitely prefer gas and ether. I will now describe the apparatus I employ and the method of administration. In giving gas and ethyl chloride it is important to avoid complicated or cumbersome apparatus; furthermore, the employment of lint diaphragms or cotton-wool or of any arrangement in which the ethyl chloride is discharged into the face-piece, will be found most unsatisfactory. I insist on the following points:—

1. A 1-gallon bag of gas should be used, and rebreathing permitted from the first.
2. The ethyl chloride should be discharged directly into the bag.
3. The dose must be accurately measured into a graduated glass tube, which should be attached to the apparatus before the administration begins.
4. The channels through which the patient breathes should be wide.

I demand that the apparatus should be simple and efficient, free from unnecessary complications, strong, cheap, easy to

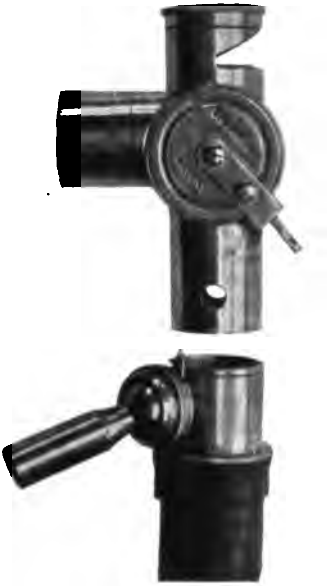

Fig. 1.

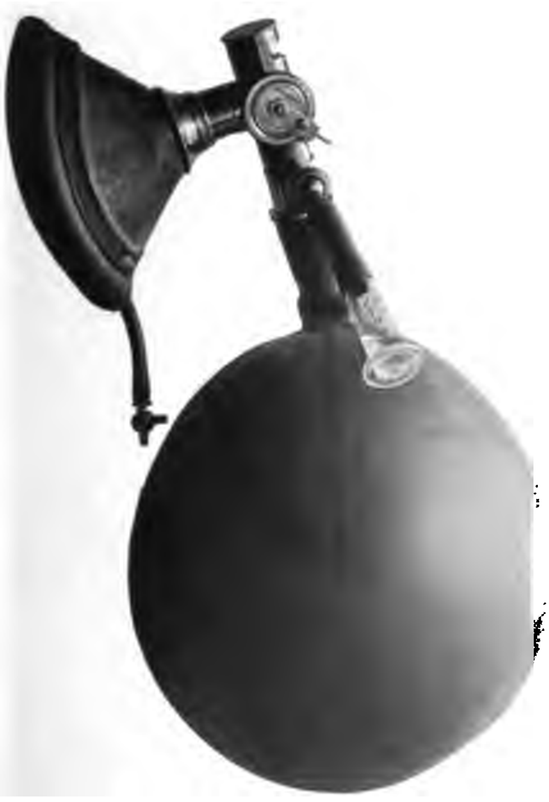

Fig. 2

sterilise, and adaptable for gas alone or gas and ether. The arrangement I have devised to fill my requirements has for its component parts, a Clover's face-piece, a red rubber bag of 1 gallon capacity for gas and ethyl chloride, another of 2 gallons capacity for gas, or gas and ether, a graduated glass measure to hold 5 c.c., and a Barth 3-way tap, which carries a feed-tube mounted on a ball and socket joint. Through this tube the gas and subsequently the ethyl chloride are introduced into the bag (Fig. 1 shows the arrangement). A hole is made half-way up the upper part of the bag mount, the feed-tube mounted in its ball and socket joint is continuous with this hole. In the perpendicular part of the 3-way tap a corresponding hole is filed; a pointer on the bag mount and an arrow on the perpendicular arm of the tap serve to show when the two holes are in exact register. As an additional convenience, another opening is made exactly opposite the first, so that gas or ethyl chloride can be introduced at either side. The apparatus is made by Messrs. Gardner & Son, Forrest Road. Fig. 2 shows the apparatus ready for gas and ethyl chloride. It is prepared thus—The 1-gallon bag is used. Turn the tap to air. Fill the bag with gas. Rotate the bag mount through a quarter of a circle; this incarcerates the gas. Disconnect the rubber supply tube. Attach the measure containing the ethyl chloride to the feed-tube by means of its rubber tubing, taking care that the feed-tube is in its most pendent position, rotate back the bag mount till the pointer and arrow are in register, and all is, as in Fig. 2, ready for the administration.

The patient may be either sitting or lying down, but for dental operations the sitting position is preferred. Care must be taken that the neck is not stretched at all. The head should not be thrown back, a common malposition, nor should the chin be sunk on the chest. The attitude of head one instinctively adopts for reading, looking a little down, is the best. The legs should be extended, the hands should rest on the lap with the fingers interlaced. A gag should now be introduced. I always place the gag centrally; in this position it is more comfortable for the patient. The books advise that the gag should be put at the side. Hewitt's gags, which are up to now the best and most extensively used, are devised for use at the side. The objection stated to the use of the gag in the central position is that it may break a front tooth or force out loose teeth. This, as a matter of fact, does not happen, and if it did such teeth are better out and replaced by artificial substitutes. My objection to the use of the gag at the side is that it is much more likely to embarrass the tongue and produce incomplete swallowing movements, and consequent blocking by the tongue of the upper respiratory passages. I have modified Hewitt's gags, giving them horizontal instead of sloping surfaces. Instead of the special rubber covers he uses, which are apt to perish, I use an inch of red rubber tubing, in which I cut a hole. This is thicker, gives a better surface to bite on, and is so cheap that it may be renewed regardless of expense. I use two sizes, and I have them united by a neat chain instead of a dirty piece of cord or catgut. They are made by Gardner & Son. *Apropos* of gags, I would advocate the use of a small centrally placed gag as a routine procedure in anæsthesia. The ready access thus afforded to the mouth in case of respiratory embarrassment is a boon of incalculable value; indeed, it is to this that I attribute my immunity from accident. I never require to do more than pass my finger to the back of the mouth, clearing away any mucus; and then depress the back of the tongue. This coupled, if need be, with the pressure of the other hand on the chest, sets the breathing going again. But observe, I do not defer this manœuvre till the patient is dead or moribund. I perform it at once on the appearance of obstructive respiration. No more alarming sight can affright the anæsthetist than that of a strong healthy patient cyanosed, with complete apnœa and firmly clenched teeth from spasm of the masseter; it is one that need seldom be seen if the simple precaution I indicate be taken. Before sitting down, the patient should be directed to clear the throat and blow the nose. The anæsthetist should grasp the face-piece firmly in his right hand. He takes his stand at the left side of the patient and passes his right arm round the patient's head and the head-piece of the chair, so that he has the patient's head, in vulgar but expressive parlance, in his "oxter." He now places the point or apex of the face-piece (the pneumatic pad of which should be not too firmly inflated) on the bridge of the patient's nose, and adjusts the face-piece by pressing it downwards and towards the face. He places the ball of his left hand on the top of the 3-way tap, and his middle finger under the tap feels the breath on the palm of his hand, and at the end of an expiration he turns the tap right on to "no valves." He should never request the patient to breathe deeply, rather should he ask him to "take it easy"; forced breathing is apt to bring on respiratory spasm. He now watches the bag, the patient breathes to and fro; after five respirations, the anæthetist warns the patient not to mind the smell, and gently with his left hand lifts up the supply tube and pours the ethyl chloride into the bag; he watches the bag, notes the first inspiration of the mixture, allows the patient to respire the mixture for twenty-five seconds, and removes the face-piece. As patients sometimes hold the breath for a few seconds, not liking the smell, it is important to note that the time consumed in that way should not be counted into the twenty-five seconds. I am well aware that these directions sound unscientific and empirical; but in cosmetic operations above all others the safety of the patient must be the paramount consideration. By following these directions, a wonderfully uniform series of anæsthesias is obtained. There may be occasionally a shorter anæsthesia than usual, but, on the other hand, the induction is pleasant, the recovery immediate, and the after-effects either absent or unimportant. There is no chance of asphyxiating the patient by the deprivation of oxygen in the short time the face-piece is on, consequently there is no cyanosis, the residual air being sufficient to oxygenate the blood for the brief period; and with the dose limited to 3 c.c., and the time of inhalation also limited, there is no chance of giving an overdose. I append notes of twenty-five cases taken from the records of the Dental Hospital. There are one or two further points to which attention must be drawn. The temperature of the room should not be below 60° F. The bag must be dry. No operation should be attempted which is likely to take more than ninety seconds. The operator should remember that the period of analgesia after complete anæsthesia fades is very short, in marked contrast to the prolonged analgesia of gas and ether. The mixture should be regarded strictly as a single dose anæsthetic; no reapplication at the same sitting should ever be made. I should entirely decline to be responsible for the result of a reapplication of this drug. Many anæsthetists have given ethyl chloride for operations for a quarter or half an hour's duration; its use in this manner is, to my mind, considering the choice one has of safer and more suitable reagents, quite indefensible.

In the case of children, the dose is less, from 1 c.c. to 2 c.c.; the time of inhalation to young children is also less, sometimes as little as ten seconds, commonly fifteen and twenty seconds. There is seldom any muscular rigidity with the mixture, although this is a frequent concomitant of ethyl chloride anæsthesia. There is far less excitement and struggling than with any other anæsthetic I have seen, and next to gas it is the pleasantest to take. It is time for ethyl chloride to be rehabilitated in the eyes of the profession and the public. I think the process would be hastened if its use alone were abandoned, if the limitations of the drug were recognised, if it were administered only in mixture with gas as a suitable apparatus, and with a strictly defined maximum dose and time of inhalation, never be exceeded, save by exceptionally skilled and experienced anæsthetists.

TABLE.—*Notes of Twenty-five Consecutive Cases extracted from a series of over Four Thousand in the Dental Hospital Records.*

No.	Sex.	Age.	Anæsthetic.		Time of Induction.		No. of Teeth.	Available Anæsthesia.
			Gas.	Ethyl Chloride.	Gas.	Gas and Ethyl Chloride.		
1	Female	35	1 Gal.	3 c.c.	5 Resp.	25 Seconds.	6	95 Seconds.
2	,,	20	,,	3 ,,	,,	25 ,,	11	85 ,,
3	,,	22	,,	3 ,,	,,	25 ,,	14	100 ,,
4	,,	25	,,	3 ,,	,,	25 ,,	2	95 ,,
5	,,	19	,,	3 ,,	,,	25 ,,	7	95 ,,
6	,,	30	,,	3 ,,	,,	25 ,,	5	100 ,,
7	,,	40	,,	3 ,,	,,	25 ,,	2	95 ,,
8	,,	22	,,	3 ,,	,,	25 ,,	2	95 ,,
9	,,	25	,,	3 ,,	,,	25 ,,	7	95 ,,
10	,,	23	,,	3 ,,	,,	25 ,,	2	95 ,,
11	,,	29	,,	3 ,,	,,	25 ,,	5	95 ,,
12	,,	24	,,	3 ,,	,,	25 ,,	2	90 ,,
13	,,	7	,,	1½ ,,	,,	20 ,,	5	60 ,,
14	Male	24	,,	3 ,,	,,	25 ,,	3	95 ,,
15	Female	28	,,	2 ,,	,,	25 ,,	1	75 ,,
16	,,	26	,,	3 ,,	,,	25 ,,	10	90 ,,
17	,,	30	,,	3 ,,	,,	25 ,,	4	95 ,,
18	,,	12	,,	3 ,,	,,	25 ,,	8	95 ,,
19	,,	28	,,	3 ,,	,,	25 ,,	7	110 ,,
20	,,	14	,,	2 ,,	,,	25 ,,	6	65 ,,
21	,,	26	,,	3 ,,	,,	25 ,,	4	100 ,,
22	,,	6	,,	2 ,,	,,	25 ,,	5	80 ,,
23	,,	34	,,	2 ,,	,,	25 ,,	2	80 ,,
24	,,	7	,,	2 ,,	,,	25 ,,	1	70 ,,
25	,,	28	,,	3 ,,	,,	25 ,,	31	100 ,,

SIGNS AND SYMPTOMS OF MUCOUS COLITIS.

By H. DOUGLAS WILSON, M.D., *Harrogate.*

IT is only within comparatively recent years that the full importance of certain morbid conditions of the colon has come to be recognised, and a vast mass of symptoms found to be directly traceable to abnormal states of the large intestine. Moreover, the theory that the lower bowel may be the seat of toxic absorption, and acting as such be the primary factor in the causation of many disorders, is daily finding more support.

We owe much of our knowledge on these subjects to Continental and American writers, but English literature on them is somewhat meagre. Practically all writers on mucous colitis place the intestinal symptoms first, giving especial prominence to the passage of mucus per anum as the most notable sign of the disease, and scarcely touching on the secondary or toxic symptoms. All one's experience, however, goes to show that one is more than justified in looking at the disease from a different and much broader point of view. One often sees patients in whom the intestinal symptoms are from the sufferer's point of view negligible, and who are the last to imagine that anything is amiss with their intestinal tract, and yet in these very people the toxic symptoms may be such as to render life almost unendurable. These cases are only to be recognised on careful and systematic investigation and the diagnosis clinched by a thorough examination of the stools. It may be stated, however, that only on irrigating the bowel is the presence of mucus easily seen in a certain number of cases.

If it were more fully borne in mind what an important part the colon plays in the health of the individual, diagnosis and treatment would frequently be different; and yet while this is so, inquiry as to intestinal functions too often begins and ends with a question as to the state of the bowels. This paper is written with the object of drawing attention to the prevalence of mucous colitis, of recounting its more common signs and symptoms, and of showing how the various systems may be affected by its presence. It is largely based on observations of cases which have been under the writer's care, and who have been given the treatment as prescribed at Harrogate for such conditions, namely, intestinal douching, combined with other spa methods.

A few words, however, must be said on some other points. The *classifications* of mucous colitis, amongst the most recent of which is that of Caley,[1] have usually been made from the pathological rather than the clinical point of view, and owing to this fact are not entirely satisfactory, and have led to much misconception as to the nature of the disease. With regard to *nomenclature* many and various are the names that have been applied to it. Sir James Simpson[1] recognised the disease as "pellicular enteritis," and some forms of it were known in his time as "skinny bowel."

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[1] *Brit. Med. Journ.*, London, 1906, June 9.

Blake[2] has collected some seventy titles that have been applied to it by different authors.

"Mucous colitis" or simply "colitis" seems as satisfactory a name as any; it at all events has the merit of brevity as compared with many used, but at the same time is in certain respects inadequate.

Its *definition* is fraught with almost as many difficulties as that of normal labour, but we recognise it as a disease in which the functions of the colon are impaired, in which constipation in some form is present, in which abnormal secretion of mucus from the colon is found, and in which symptoms of autotoxis exist.

Opinions as to its *etiology* are very divided. The nerve origin of the disease has many supporters, and much can be said in its favour. It is prone to occur in "nervous" and neurasthenic subjects, and undoubtedly nerve symptoms of some sort are of extreme frequency in patients suffering from it. It tends to run in families, especially in those in which there is a history of neurosis in some form. It bears a distinct relationship to various arthritic troubles, and some French writers have termed it a neuro-arthritic complaint.

As to its *frequency of incidence*. Cases in which mucous colitis is recognised because of the fact that the patient seeks advice complaining of abdominal symptoms and of the passage of mucus per anum, although not infrequent, are *relatively* uncommon as compared with those suffering from toxic symptoms, and in whom the passage of mucus by the bowel is only easily recognised when it is brought away by intestinal irrigation.

Including all cases, the disease is infinitely more prevalent than is generally supposed. It affects all ranks of society, but especially the well-to-do, and both sexes in about equal proportions, the majority, however, being females.

The *age* at which it may commence is difficult to ascertain, as frequently the onset is insidious and the early symptoms not of sufficient importance to the patient's mind as to lead him to seek medical advice.

THE ALIMENTARY SYSTEM.—The appearance of the tongue in many cases of mucous colitis presents almost characteristic features. In a large number of such patients it looks pale, flabby, and anæmic. It frequently looks swollen and too big for the mouth. Less commonly it is of a reddish tint, raw, or glazed. It is apt to be coated with a whitish fur, especially at the back. The papillæ are often hypertrophied, and it may be dotted over with bright pink spots. Froussard calls attention to the fact that its sides and point may be of a peculiar reddish shade, which he thinks is typical of the disease. The tongue is rarely the seat of local inflammatory patches or spots, but the gums and lining of the cheeks may show small whitish areas surrounded by a zone of inflammation.

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[1] "Obstetrical Memoirs and Contributions."

[2] "Intestinal Catarrhs."

Granular pharyngitis exists in a comparatively large number of cases.

Symptoms of stomach trouble are frequently present, and often prove misleading, as they may be prominent features.

Abdominal discomfort may occur after food; if it does so, it usually commences about two hours after eating, is most marked in the region of the transverse colon, and is commonly relieved by taking another meal. Acute abdominal pain does not occur so frequently as is generally thought to be the case. Some authorities would lead one to infer that it is frequently present, but in many of the most marked cases of mucous colitis it does not exist. Acute attacks are often followed by the passage of mucus.

Examination of the abdomen.—In a certain proportion of cases comparatively little is to be gleaned from abdominal examination, but these cases form a very small minority. It is recommended that the patient be examined sitting or standing as well as when lying down.

Inspection.—The normal abdominal contour is frequently found to be altered, and distension or retraction noted, the former in the region of the colon, especially in its transverse or ascending portions, and also about the cæcum. Occasionally the abdomen may appear generally retracted; this is more commonly seen in those who suffer from attacks of pain and where a spastic state of the bowel is marked. Peristaltic movements of the small intestine, the so-called "ladder pattern," are occasionally but rarely visible. In only two cases has the writer seen them; both suffered from stomach trouble, were marked cases of enterospasm, and in one of them there was reason to believe that the small intestine was affected. In neither case, however, was there any sign of organic stricture of the bowel.

Palpation and percussion.—The abdominal walls in the great majority of cases offer an abnormally lessened resistance to the examining hand, and the muscles are frequently thin and flabby even in well-developed subjects. Rigidity of the walls sometimes is found, especially in those who suffer much pain. Enterospasm or spasmodic contraction of some part of the colon is found to exist in the great majority of the cases, but it must be remembered that the results of abdominal examination may vary very greatly from time to time in the same individual. The most common site of this contraction is the descending portion of the bowel; much more rarely is it found in the ascending and transverse parts. It may be intermittently present, and it sometimes happens that during an examination, the colon, which was previously in a flaccid state, can more or less suddenly be felt contracting under the hand. The degree of contraction varies very much, and may be so great as to make the bowel feel hard and rope-like.

Dilatation of the colon is frequently present, its most common sites being the transverse and ascending portions, the cæcum, the hepatic and splenic flexures. This order is a fair average of the position in which dilatation and distension of the colon are most often found. Splashing in the transverse colon is observed in many cases; such a condition is liable to be mistaken for a dilated stomach, this error being all the more apt to occur where stomach symptoms are marked. In palpating the colon, tender areas are sometimes revealed, and are prone to be somewhat misleading if about the iliac fossæ. In a fairly large number of cases a typical and characteristic crepitating or gurgling sensation is to be made out, and is most commonly present in the region of the cæcum and first part of the ascending portion of the bowel.

The right kidney is very frequently movable, and may be floating, the left less often so. These conditions of the kidney are of interest, as it often happens that many of the symptoms of which the patient complains are ascribed to them, and in consequence the bowel state may be overlooked. This being particularly liable to occur in cases exhibiting neurasthenic symptoms. One would go so far as to say that in all cases of floating or movable kidney in which troublesome symptoms are present, the state of the colon should be most carefully inquired into.

Enteroptosis is present in a certain number of cases, but is not so frequently met with as some of the French writers would have us believe. Glenard has noted the association of the disease known by his name with mucous colitis.

It is said by some authors that in cases of mucous colitis the liver is diminished in size; this is a point of considerable doubt; it is, however, often difficult to accurately define its lower border owing to the distended state of the bowel.

Intestinal functions.—The action of the bowels is, in the vast majority of cases, characterised by some irregularity. It is distinctly uncommon to find that an *efficient* daily evacuation is obtained unless artificial aid is resorted to. It is, however, true that the bowels may act more or less regularly of their own accord, and so mislead the patient, often making it a matter of difficulty to convince him that the intestine is at fault. Even in such cases careful examination of the fæces usually reveals some abnormality.

Constipation in some form or other is one of the most constant symptoms. Even in those cases just referred to in which the bowels act daily without the aid of drugs, it is often surprising what an enormous quantity of scybalæ intestinal douching may reveal. On inquiry, it is frequently found that constipation has existed from the patient's earliest recollection, and to have preceded other symptoms of which he complains. It may be constantly of the most obstinate type or only small doses of an aperient may be necessary to get the bowels to act. Its degree may vary much from time to time in the same patient, when it is increased other symptoms at the same time becoming more marked. It sometimes alternates with loose actions, the latter usually occurring in those who suffer from attacks of abdominal pain. After the bowels have moved, the patient often complains that an unsatisfied sensation remains as if something still remained that should come away.

Characters of excreta.—It is of the greatest importance that attention should be paid to the examination of the fæces. Their colour varies in different cases and commonly in the same individual. It is of frequent occurrence that they are abnormally pale and may even be clay- or putty-coloured, although the patient may show no signs of jaundice. Occasionally they are very dark. It is of interest to note that when a course of intestinal irrigation is administered to a patient whose stools are unusually pale, the colour of the fæces gradually improves, and in a certain number of such cases greenish stools are passed. This occurrence often coincides with marked improvement in the condition of the patient. The shape of the fæces is of some importance. As already noted, it is common to find constipation present, and they may be passed in hard masses or lumps, or hard old fæces passed with softer motion. They also may be passed in the form of a smooth cylinder, or may be much flattened or ribbon-like.

Loose actions, which may be a continual source of annoyance because of their frequency, rarely show the characters of an ordinary diarrhœa motion, but as a rule consist of watery material, mucus, and bits of fæces in small pieces. Sometimes in response to an urgent call to stool nothing is passed but mucus. It is by no means uncommon to find that mucus in the stools is present without the patient being aware of the fact, and may be unobserved unless carefully looked for. This is all the more likely to occur where it is coated over with fæces or forms a covering to them. In the former condition it may be necessary to break up the motion to find it; in the latter it is more readily seen if the fæces are floated in water. Even after active purgation, little mucus may be found, but in these very cases internal douches may show it to be present in large quantities. The appearance of mucus in the stools may also be intermittent, careful examination may fail to show it, and yet a little later it may be passed in considerable amounts. Mucus from the bowel may be seen in several forms. It may be of frothy, semifluid, or jelly-like consistence, or in cast-like or membranous material. It is often seen as strings and shreds. Its colour varies. It may be semitransparent and whitish, and thus has been mistaken for pieces of tapeworm. Sometimes it is of much the same colour as the fæces. Casts vary much in size, and from 1 to 10 in. in length, but cases are recorded in which much longer ones have been passed. They may assume a cylindrical form, although it is much more common to find them in a broken-up state. Chemically, casts and membranous material passed by the bowel are found to consist chiefly of mucus. It is a matter of great doubt if they ever contain fibrin. Microscopically, they show a hyaline matrix in which are found many cells of cylindrical epithelium in a more or less broken-up state. "Intestinal sand" is sometimes passed by those suffering from mucous colitis. Undigested food is seen in the stools with comparative frequency; when thus passed it is often found to consist of pieces of meat, fish, and vegetable, and may look as if apparently unaffected by the digestive process.

THE CIRCULATORY SYSTEM.—Many cases show disturbance of the circulation in some form. This disturbance is frequently functional in character, and in the majority of cases may be traced to the absorption of toxic products from the intestine.

Patients commonly complain that they suffer from "want of circulation" and from coldness of the extremities. Palpitation and irregular action of the heart may be marked. Dyspnœa and præcordial pain and distress are rare symptoms, but may be set up by a distended colon acting on an already embarrassed heart.

The pulse.—The rate may be lowered especially in those cases exhibiting marked evidence of auto-intoxication. In some of these cases it may fall below 50, but its characters largely depend on the manner in which the disease affects the various systems. The blood pressure varies greatly in different cases. In those showing evidence of marked toxic absorption from the intestinal tract it may fall to 80 or below it. It must be remembered, however, that Metchnikoff considers that the causation of anterio-sclerosis is intimately connected with morbid conditions of the colon. There is no doubt that this is the case in "gouty" subjects.

RESPIRATORY SYSTEM.—The mucous membrane of the respiratory tract, like all the lining membranes of the body, is easily irritated, and subjects suffering from mucous colitis seem to catch colds very easily. Hypersecretion of mucus from some part of the tract is not uncommon, and attacks of an asthmatic type may bear distinct relationship to the condition of the colon.

GENITO-URINARY SYSTEM.—The occurrence of movable or floating kidney has already been referred to.

Catarrhal conditions of the genito-urinary tract are commonly found to exist. Irritability of the bladder is present in a fairly large percentage of cases. In females disorders of menstruation may be met with. The menses often appear with abnormal frequency, less commonly dysmenorrhœa or ovarian pain is present. These symptoms are generally relieved, or may even disappear, as the colon is got into a better state. In the male, especially if mental depression is a marked feature, the patient may complain of impotence.

The urine may vary in quantity from time to time in the same patient. Its colour is often of an almost greenish tinge, and it is frequently somewhat turbid even when recently passed. In a large number of cases it gives a very marked acid reaction. When toxic symptoms are much in evidence, the quantity passed may be diminished, it may then give off a somewhat peculiar aromatic odour, and be occasionally very offensive; as the attack passes off, large quantities of pale urine are passed. It frequently shows a deposit of mucus and sometimes of amorphous urates. Traces of albumin or sugar may be found; these often disappear during a course of intestinal douching. In more than one case of diabetes mellitus in which mucous colitis was present, colon irrigation had the effect of largely diminishing the output of sugar, and the patients improved to a very marked degree in every way.

THE LOCOMOTORY SYSTEM.—Absorption of toxic products from the large intestine plays a most important part in the causation of many arthritic diseases.

In all cases of rheumatoid arthritis the condition of the colon should receive special attention, for in a number of such cases one has been able to prove that this disease has followed the onset of mucous colitis, and that the greatest benefit is to be derived from a course of intestinal douching, often after all other methods have failed to stay its progress or alleviate its symptoms.

The same applies to gout and the various gouty states. This disease has long been thought by many observers to be intimately connected with toxic absorption from the intestinal tract. One's experience all goes to show that in its causation morbid states of the colon play a part of the greatest importance.

Evidences of rheumatism are frequently met with in those suffering from mucous colitis, and rheumatic fibrocytic nodules are often found in muscles and muscle sheaths, and along the course of nerves. Want of muscular tone and great loss of weight are often met with.

THE NERVOUS SYSTEM.—In practically all cases of mucous colitis, nervous symptoms of some sort are present. It is exceedingly common to find that such patients are "highly strung" or may be neurasthenics of the most pronounced type.

Mental functions are often somewhat dull, especially where much toxic absorption is going on. The patient may complain of inertia and want of energy, of difficulty in fixing his mind on business, of difficulty in remembering small things such as names, dates, and numbers, and of feeling what he may call "liverish." These states are often most marked in the early morning, and tend to a certain extent to wear off as the day proceeds. Mental depression may be so great as to make life almost unbearable.

Occasionally, but more rarely, insomnia is present. Irritability of temper is often marked. The incidence of some forms of mucous colitis in asylum practice is well known.

Butler[1] writes of the nervous system in the disease as follows:—"The nervous phenomena are peculiar and striking in the extreme; some of these are practically of invariable importance in this disease. Amongst them hysteria and hysterical stigmata of all kinds, hysterical coma, convulsions, and aphasia; neurasthenia, vertigo, attacks of blue nails and lips, tingling and numbness of hands and feet, acute neuralgias of all parts of the body, pain in the external ear, tender scalp, tinnitus aurium, hyperæsthesia, parasthesia, anæsthesia, temporary defects of vision, morbid alterations of taste, irregular muscular tremors, paresis, paralysis chorea, catalepsy, amnesic aphasia, mental depression, poor memory, hypochondriasis, and melancholia. Many if not all of these are transient, and, in the absence of definitely ascertained lesions, functional in character."

This somewhat formidable-looking list may at first glance appear a trifle too comprehensive, yet it is none the less quite possible to meet with conditions as described by Butler.

Da Costa[2] writes upon the necessity of inquiring as to the state of the colon in every case of anomalous nervous disease, especially when occurring in hysterical persons.

Mucous colitis may sometimes be found to be present in diseases of the spinal cord.

THE INTEGUMENTARY SYSTEM.—Cases of skin disease are often met with in which the state of the colon, as proved by the results of treatment, is at the root of the trouble. The origin of most of these can be ascribed in almost all instances to toxic absorption from the intestine.

Cases of acne, prurigo, urticaria, and various herpetic eruptions, eczema and psoriasis, have been seen to benefit when the colon has got into a healthier condition, in many of these local treatment having failed to bring about desired results.

Johnston,[3] in a paper on the autotoxic factor in the production of bullous disease, advises lavage of the colon, and he brings forward much evidence to prove what an important part the intestine plays in its causation.

DIAGNOSIS.—It must be remembered that mucous colitis in its varied forms, and cases whose symptoms are directly traceable to absorption of toxic products from the large intestine, are commonly to be met with. As already noted, abdominal symptoms are not always by any means marked, and it is a mistake to imagine that a patient suffering from the disease must pass mucus in very obvious quantity. Errors of diagnosis may readily occur if cases are looked at in the light of their secondary symptoms only. One would like to insist upon the necessity of making the thorough examination of the colon as much of a routine as is that of the stomach, heart, or other important organ.

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[1] "Diagnostics of Internal Medicine."

[2] *Am. Journ. Med. Sc.*, Phila., vol. lxii.

[3] *Brit. Med. Journ.*, London, 1906, October 6.

Treatment.—The use of balneotherapeutic measures for the treatment of the disease we have been considering is attended with excellent results, often after the usual methods have met with little or no success. Special baths for the treatment of mucous colitis have for long been in use on the Continent, and until introduced at Harrogate, where a building has been erected for their installation, were unobtainable in this country.

The baths consist of two parts, which may be given together or separately as the medical attendant may direct.

(*A*) *The intestinal douche* is administered while the patient lies on a special couch. A rubber tube, the lengths used varying from 14 to 17 in., according to prescription, is passed into the bowel by an experienced attendant, and the prescribed amount of hot mineral water allowed gently to flow from a jacketed cylinder, the pressure being graduated according to directions. The patient's position is altered during the time the douche is retained, the bowel emptied, and the process repeated.

(*B*) *The Tivoli douche.*—This consists of an ordinary reclining bath, in which the patient lies covered, except for the head and neck, with warm mineral water. While lying in this way a hot wave douche is played on the abdomen from a special apparatus, and is usually prescribed at a much higher temperature than that of the bath. These methods are carried out in conjunction with special dieting, massage, and the drinking of mineral waters.

OBSERVATIONS ON THE EFFECT OF PROLONGED AND SEVERE EXERTION ON THE BLOOD PRESSURE IN HEALTHY ATHLETES.

By G. A. Gordon, M.B., *Resident Physician, Royal Infirmary, Edinburgh.*

A unique opportunity was recently afforded at the Waverley Market, Edinburgh, to observe the effect of severe muscular exercise on the blood pressure of a healthy athlete. The observations were undertaken at the suggestion of Lieut.-Col. Deane, R.A.M.C., and were carried out under the guidance of Dr. Gibson. The subject of the observations was Tom Burrows, the Champion Club-swinger of the World, who had arranged to swing his clubs for twelve hours continuously on six consecutive days. Tom Burrows is 38 years of age, and has been engaged in teaching the use of Indian clubs for over twenty years. In 1892 he was champion of Australia, and he has frequently given prolonged exhibitions of his powers of endurance. The combined weight of the clubs was 3 lbs.

On making an examination of Burrows before he began his exhibition, his arterial walls were found to be perfectly healthy, with no traces of sclerosis; his heart was slightly hypertrophied, the apex being in the fifth interspace, 4¼ in. from the middle line; his maximum systolic pressure measured only 105 mm. of mercury. The observations on blood pressure were made by means of the Riva Rocci instrument, and also by Erlanger's sphygmomanometer. On taking a tracing by means of Erlanger's instrument two days before Burrows began his exhibition, the maximum systolic pressure (M.S.P.) measured 100, while the maximum diastolic pressure (M.D.P.) measured 70, in millimetres of mercury. At the end of the day the M.S.P. was 115 and the M.D.P. 80, showing a rise of 15 in the systolic and of 10 in the diastolic pressures.

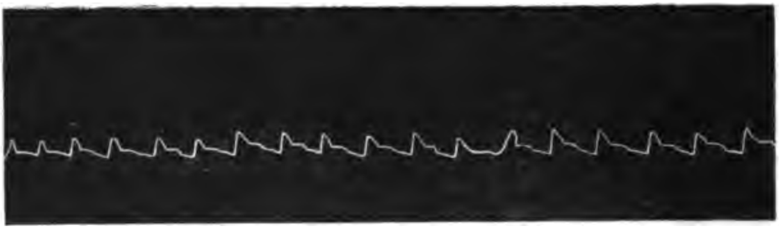

Fig. 1.—Before beginning his twelve hours' swing, first day. M.S.P. =105.

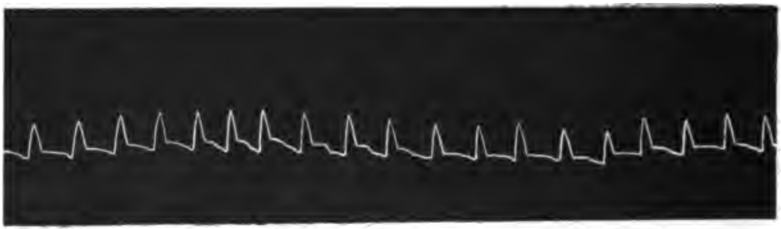

Fig. 2.—After swinging for twelve hours, first day. M.S.P. =103.

Readings were taken daily before and after his twelve hours' swing, and on every occasion a rise in blood pressure was found, in one case reaching 15 mm. Hg.

A point of interest to note is the small difference that existed between the maximum systolic and the maximum diastolic pressures.

The following table shows the rise on each day, the results on the last day being unusually high, due either to excitement or to the fact of his having had an X-ray photograph taken.

TABLE I.—*Showing Morning and Evening Differences in Maximum Systolic Pressure.*

	Morning.	Evening.	Difference.
1st day . .	105 mm. Hg.	109 mm. Hg.	4 +
2nd ,, . .	100 ,, ,,	115 ,, ,,	15 +
3rd ,, . .	107 ,, ,,	115 ,, ,,	8 +
4th ,, . .	100 ,, ,,	105 ,, ,,	5 +
5th ,, . .	105 ,, ,,	115 ,, ,,	10 +
6th ,, . .	120 ,, ,,	125 ,, ,,	5 +

From this table it will be seen that every morning the pressure had returned to a normal of from 100 to 107 mm. Hg, and that every evening it had risen to a greater or less extent. The rise in pressure did not last long, for on the last day the pressure had fallen to 100 an hour after the completion of his task.

An interesting fact is the small effect this prolonged exertion had on the heart and pulse. The latter never varied at all, but

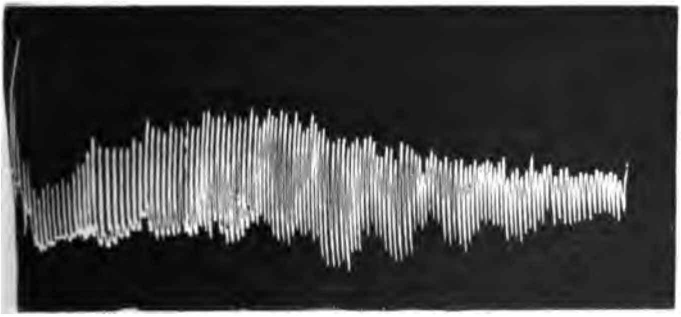

FIG. 3.—Before swinging, fourth day. M.S.P. = 100 ; M.D.P. = 85.

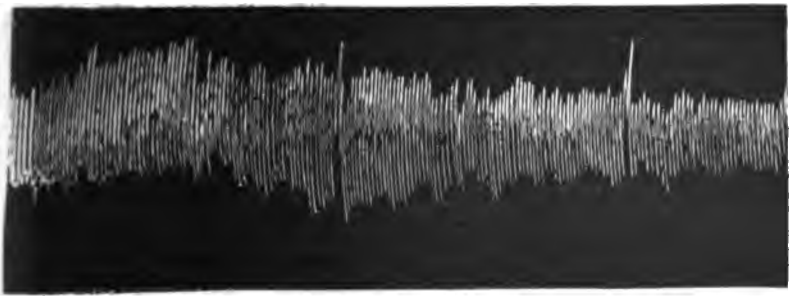

FIG. 4.—After swinging for twelve hours, fourth day. M.S.P. = 105
M.D.P. = 92

was 84 both before and after the performance. The irregularities seen in the blood pressure tracing taken at the end of the performance were due to movements on the part of Burrows, and not to any irregularity of the heart's action.

Burrows' heart was measured both by careful percussion and also by X-ray photographs, kindly taken by Dr. Spence at the Royal Infirmary, before and after the last day's performance, when no perceptible change in size was detected.

Though the effect on the circulation was so slight, yet analysis of the urine showed the presence of albumin in that passed during and after the performance, while in the morning urine none was found.

TABLE II.—*Analysis of Urine of One Day.*

	Amount.	Urea.	Albumin.
Before performance . .	13 oz.	18 grs. per oz.	Absent.
During ,, . .	11 ,,	11·5 ,, ,,	Trace.
After ,, . .	25 ,,	15 ,, ,,	,,
Total in 24 hours . .	49 oz.	725 grs.	

In striking contrast to the foregoing facts regarding blood pressure were the results obtained in two of the players in the International Rugby Football Match lately played between Scotland and Ireland.

Readings were taken by means of the Riva Rocci sphygmomanometer just before starting the match, and again immediately at the close.

In this case a marked fall in blood pressure was observed in both cases, one falling from 135 mm. Hg to 110 mm. Hg, the other from 145 mm. Hg to 120 mm. Hg, a fall in each of 25 mm. Hg of systolic pressure.

The general result of these observations goes to show that long-continued exercise of a more or less gentle character has a tendency to raise the blood pressure, while violent exercise, though perhaps causing a primary rise in pressure, yet is followed later by a marked fall.

The slight effect that such a severe test had on Burrows must have been due to his perfect state of training, for in an imperfectly trained person a fall in blood pressure would certainly result. The results obtained in the players in the International Rugby Match seem to point to the fact that the strain was too great a tax on them. It is a matter of conjecture, however, whether a man could ever become sufficiently trained so that a violent strain, such as a first-class Rugby football match, would cause a rise instead of a fall in blood pressure.

TWO CASES OF RENAL SARCOMA IN CHILDREN; WITH SOME REMARKS ON THE PATHOLOGY AND THE RECENT RESULTS OF SURGICAL TREATMENT.

By K. W. MONSARRAT, F.R.C.S.Ed., *Surgeon to the Northern Hospital, Liverpool.*

IN vol. iii. part ii. of the *Thompson-Yates Laboratories Reports,* 1901, I described in detail the pathological anatomy and histology of a primary malignant growth removed from a child aged 3 years. In this paper I propose to record the clinical history and final result of this case, and the clinical history of a second case, which has recently been under my care.

CASE 1.—Boy, æt. 3 years, was admitted to the Liverpool Infirmary for Children on 12th September 1900. His previous illnesses had been measles and whooping-cough. His father was a chronic invalid from "rheumatism"; one brother died from convulsions, another brother has dropsy, and a sister has adenoids and is stunted in growth. Twelve months previously his mother noticed a small lump in the abdomen on the right side, which moved about when it was pressed; during the last six months she had noticed that this lump had become much larger and harder. The boy had occasionally passed blood in his urine. For some weeks before admission he had been feverish and drowsy, and had often vomited after meals.

On examination of the abdomen, a large mass was found extending from the right lumbar region forwards to a point half an inch to the left of the navel, and filling the space between the lower ribs and the iliac crest. It was movable to a considerable extent, of firm consistence and painless. The ascending colon crossed the mass on its inner border. The general condition was fair, the skin was brown in colour, and markedly so in the axillæ and over the neck. The urine was acid in reaction, and contained no albumin, blood, or sugar. It was impossible to measure its amount accurately before the operation, but on the four days preceding this the amounts recovered were 12½ oz., 12 oz., 6½ oz., 8 oz.

Operation on 20th September 1900.—A vertical incision was made about 5 in. in length, an inch to the right of the middle line, and from the centre of this a second passed towards the loin at right angles. The tumour was removed without much difficulty; there was little hæmorrhage, but a considerable amount of shock. The wound was entirely closed. The mass removed weighed 2 lbs. 6 oz. Convalescence was tedious owing to enteritis, and suppuration around two stitches resulted in a sinus, which persisted for almost three months. The left kidney performed its functions satisfactorily; the average amount of urine passed on the seven days following operation was 14·7 oz. The total urea excreted in twenty-four hours was estimated on thirteen occasions after operation, the average being 128·8 grs. The child left hospital on 14th December in apparent good health, and was seen on 28th December, when his condition also seemed satisfactory.

The subsequent history, obtained from the mother, is that towards the end of January there was a recurrence of the "discharge" from his wound; after this he got steadily worse, but no further medical advice was sought, and he died at the end of March. The mother states that there was swelling of the legs and lower part of the abdomen. If this history is correct, the inferior vena cava was probably blocked by growth. The death occurred six months after operation.

The growth was a sarcoma, containing, however, numerous tubules ending blindly in dilated extremities, and also striated muscle fibres.

Case 2.—Boy, æt. 5 years, seen on 27th September 1906, at the Infirmary for Children, in consultation with Dr. Marsh and Dr. Hope-Simpson. The child's complaints had commenced only a month previously, when his parents noticed that he was languid and easily tired. The only other fact of importance in his history was that on two occasions blood had been noticed in his urine. When his health first began to suffer, he was taken to a medical man, who is said to have diagnosed a large spleen. The boy was rather thin and pallid, he complained of no pain. The abdomen was protuberant, a large tumour was to be felt on the left side. This extended backwards into the left loin; above, its highest point was in the nipple line, where it reached the eighth costal cartilage; below, its lowest point was on a level with the middle of Poupart's ligament, and in front it extended an inch beyond the umbilicus. It was nodular as to its surface, with rounded borders; the descending colon was demonstrable coursing over the front just outside its inner border. The urine was acid, sp. gr. 1020, contained no albumin or blood or sugar, but a considerable number of oxalate of lime crystals.

Operation on 1st October 1906.—An incision was made from the loin forwards parallel with the twelfth rib, and reaching to within about an inch from the outer border of the left rectus. The peritoneum was opened in front. The mass was separated without great difficulty. The vessels were exposed behind, and after ligaturing three separate and independent arteries of supply, the pedicle was cleared from the front of the abdominal aorta, and the renal vein ligatured close to the vena cava. No glands separate from the mass were met with. A drainage tube was placed in the lower angle of the wound and removed next day, the wound healing without incident.

The opposite kidney caused considerable anxiety for twelve days. During the eight days following the operation an average of 8½ oz. of urine per diem were passed; on the ninth day only 3 oz. were passed, and in two specimens for the first time there was a considerable amount of blood. During the next twenty-four hours no urine at all was passed, but on the evening of 13th October 13 oz. were secreted. During the period of anuria the hot pack was used twice, caffein citrat. with pot. citrat. were given every three hours; he was encouraged to drink water, and was dry cupped in the right loin. After this the kidney acted satisfactorily, and the boy left hospital on 7th November. Up to the present his condition remains satisfactory.

The tumour removed from this child weighed (970 grms.) 2 lbs. 2 oz. The kidney is situated as a cap over the upper, outer, and front aspects of the mass. The capsule proper of the kidney is continued on to the surface of the tumour. On cutting through the kidney substance, the obliterated pelvis is opened, and it is seen that the new growth has developed from the lower and posterior segment of the organ in the kidney substance itself. The new growth is irregularly divided by fibrous septa. Sections from different parts showed a uniform structure throughout. There is one prevailing type of cell, with a large spherical nucleus and very little cytoplasm outside it. These cells are arranged either in solid masses or in solid columns, separated by myxomatous connective tissue. The arrangement, in more or less parallel columns, is quite a feature of the sections. Capillary blood vessels are numerous, and usually situated centrally in the cell masses and columns. No tubules or muscle fibres are to be seen.

Remarks on pathology.—Of the malignant tumours of the kidney met with in the fœtus, infant and child, some are purely sarcomatous in structure, and composed entirely of spherical or spindle-shaped or irregularly-shaped cells. The growth from Case 2 is an example of this type. Others contain, in addition to the sarcomatous tissue of which they are mainly composed, other tissue elements. Of these the most commonly found are tubules lined by epithelium-like cells and muscle fibres striated and non-striated. Cartilage cells and bone have also been described.[1] The growth from Case 1 contained tubules and striated muscle fibres.

The only theory which satisfactorily explains the origin of this group of malignant growths is that which ascribes their development to an aberrant process in the embryonic mesodermic tissue, from which the adult kidney is developed. They are to be classed with the malignant teratomata.

According to Bland Sutton, the epithelial cylinders are due to entanglement of uriniferous tubules in consequence of the sarcoma invading the cortex, whilst the striated spindles are derived from the muscle tissue of the renal pelvis. There are several points against this view. *First*, the muscular fibres of the renal pelvis are unstriated; *secondly*, the tubules found in these growths do not present the picture of entangled tubules, but rather of new-developed tubules adenomatous in character; *thirdly*, this view leaves unexplained the occurrence of cartilage cells; and *fourthly*, is unable to explain such an observation as that of Eberth, who described striated muscle fibres in a distant metastasis.

Symptomatology.—It is well known that these tumours are usually met with by the surgeon only when they have reached a large size, the reason being that they produce few symptoms until they reach a late stage.

Attention has in a few cases been called to the presence of a growth of this kind by some injury, but in the great majority of cases a protuberant abdomen has first led the parents to seek medical advice. The text-books state that hæmaturia is rare, but an analysis of clinical records shows that this statement is not correct. In a considerable number of cases there is no ascertained attack of hæmaturia from beginning to end, and it is undoubtedly true that hæmaturia is more common and frequent in the malignant renal growths of the adult. On the other hand, Walker, in his paper on the subject in the *Annals of Surgery*, 1897, quotes authorities whose united figures showed hæmaturia in 40 per cent. No doubt it is often overlooked. It appears that the statement that it occurs in a third of all cases would be within the mark.

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[1] V. Frisch, *Wien. klin. Wchnschr.*, 1904, p. 690.

Results of operation.—In this paper Dr. George Walker wrote a critical review of the subject of sarcoma of the kidney in children, based upon the study of 145 cases recorded in the literature. A considerable number of isolated cases and groups of cases have been recorded since the appearance of this paper. I have collected together the records which have appeared in the ten years 1897 to 1906 inclusive, in order to estimate the operative mortality and the final results of operation which are to be expected to-day. The table of cases thus constructed gives a total of 104; it is not entirely exhaustive, as there are some fifteen records to which I have been unable to obtain access, but it is sufficiently complete for the purpose for which I have used it.

First, with regard to operative mortality. Of the 104 cases, twenty-seven died from shock or other condition connected with the operation, an average mortality of 26 per cent. The younger children appear to bear the operation remarkably well; among ten cases under twelve months of age, eight recovered and two died; among twenty-three cases under two years, nineteen recovered and four died, the mortality being 20 per cent. in the first group, 17 per cent. in the second, in both cases considerably below the average.

Figures given by other writers are:

	Cases.	Mortality.
Walker (1876–1897) . . .	74	36·4 per cent.
Lewi (— 1896) . . .	62	28 „
Albarran (1876–1897) . .	97	30 „
Heresco (— 1899) . . .	53	17 „

The conclusion to be drawn from these figures is that the mortality to be expected at the present day is between 25 per cent. and 30 per cent. The variations in the numbers given by writers dealing with approximately the same periods shows the futility of drawing exact conclusions from statistics that cannot be made complete. Generally speaking, the mortality has been lowered during the last ten to fifteen years to about one-fourth of all cases, and at this figure it has remained practically stationary.

TABLE I.

Reference.	Age.	Structure.	Operation Result.	Final Result.	Hæmaturia.
Secchi, *Atti. Assoc. Med. Lombard*, 1896–7, p. 341.	2 years	Fibro-sarcoma.	R.[1]	?	No.
Dirner, *Ungar. med. Presse*, 1897.	11 ,,	Teratoma.	,,	Recurr. in 2 mths.	,,
Bergstrand, *Ann. d. mal. d. org. genito-urin.*, Paris, 1897, p. 202.	8 ,,	Hypernephroma.	,,	?	,,
Braun, "Thèse de Nancy," 1897.	5 ,,	Myo-sarcoma.	D.[2]	...	Yes.
Violi, *Pediatria*, 1897, p. 129.	2 ,,	Sarcoma.	R.	Death from croup.	...
Girard, *Dauphiné med.*, 1897, January.	3 ,,	,,	D.	...	No.
Brauninger, *Beitr. z. klin. Chir.*, Tübingen, 1897, S. 461.	3 ,,	Spindle-celled sarcoma.	,,	..	,,
Weir, *Med. News*, Phila., 1898	7 ,,	Sarcoma.	,,	...	...
Birsch-Hirschfeld, *Beitr. z. path. Anat. u. z. allg. Path.*, Jena, 1898.	4 ,,	Adeno-sarcoma.	,,	...	...
Monsarrat	3 ,,	Myo-sarcoma.	R.	Recurr. in 7 mths.	Yes.
Do.	5 ,,	Round-celled sarcoma.	,,	Well, 6 months later.	,,
Geiss, *Achtzehn Jahre. Nierenchir.*, Marburg, 1900.	4 ,,	Carcinoma.	D.	...	No.
Do., *ibid.*	9 mths.	,,	R.	No recurrence 4 years later.	...
Do., *ibid.*	2 years	Sarcoma.	D.	...	...
Israel, *Chir. klin. der Nierenkr.*, 1901.	14 ,,	Alveolar sarcoma.	R.	Well, 11 yrs. later.	No.
Do., *ibid.*	6 ,,	Spindle-celled sarcoma	,,	Well, 7½ years later.	Early.
Do., *ibid.*	15 ,,	Round-celled sarcoma.	,,	Recurr. in 6 mths.	Yes.
Do., *ibid.*	5 ,,	Adeno-myxo-sarcoma.	,,	Recurr. in 4 mths.	No. Albumin
Do., *ibid.*	7 ,,	Adeno-chondro-sarcoma.	,,	Recurr. in 7 mths.	Yes.
Rollwage, "Inaug. Diss.," Erlangen, 1901.	1¾ ,,	Adeno-sarcoma.	,,	...	No.
Rovsing, Heresco, "Thèse de Paris," 1899.	2½ ,,	Sarcoma.	,,	Recurr. in 5 wks.	...
Do., *ibid.*	11 mths.	,,	,,	Recurr. in 9 mths.	...
Do., *ibid.*	8 ,,	,,	,,	Well, 2 yrs. 3 mths. later.	...
Do., *ibid.*	14 ,,	,,	,,	Well, 1 yr. 6 mths. later.	...
Brüning, *München. med. Wchnschr.*, 1904, S. 1274.	5 ,,	Round-celled sarcoma.	,,	?	...
Ross, *Med. Press and Circ.*, London, 1903, February 11.	4 ,,	Sarcoma	,,	Well, 4 mths. later.	Hæmaturia.

[Continued.

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[1] Recovery.

[2] Death.

Reference.	Age.	Structure.	Operation Result.	Final Result.	Hæmaturia.
Muus, *Virchow's Archiv*, Bd. clv. S. 401.	18 mths.	Adeno-sarcoma.	R.	Recurr. in 2 mths.	...
Do., *ibid.*	8 years	,,	D.	...	...
Do., *ibid.*	9 mths.	Sarcoma.	R.	Well, 3 yrs. later.	...
Bastianelli, *Clin. Chir.*, Milan, 1905, p. 1321.	14 years	Myxo-sarcoma.	,,	Well, 4 yrs. later.	...
Wilms "Die Mischgeschwülste," 1899.	3 ,,	Adeno-sarcoma.	,,	Recurr. in a few months.	...
Concetti, *Riforma med.*, Roma, 1898, p. 361.	11 mths.	Myxo-sarcoma.	,,	Well, 2 yrs. later.	No.
Do., *ibid.*	2 years	,,	D.	...	,,
Marquez, "Thèse de Montpellier," 1899.	3 ,,	Sarcoma.	,,	...	,,
Do., *ibid.*	3 ,,	,,	R.	Recurr. in 6 mths.	,,
Jalaquier, *Bull. et mém. Soc. de Chir. de Paris*, 1902, p. 848.	15 mths.	Adeno-myo-sarcoma.	,,	Well, 6 months later.	...
Broca, *ibid.*, 1902, July 30 .	...	Sarcoma.	,,	Recurr. in 5 mths.	...
Picqué, *ibid.*	...	,,	,,	?	...
Churchill, *Arch. Pediat.*, N.Y., 1898, p. 887.	9 mths.	Angio-sarcoma.	D.	...	...
Kelley, *Am. Journ. Obst.*, N.Y., 1900, p. 200.	8 years	Sarcoma.	,,	...	...
Howse, Goodhart, and Still, "Diseases of Children," 1905	...	,,	,,[1]	...	...
Do., *ibid.*	...	,,	R.	?	...
Symonds, *ibid.*	...	,,	D.	...	...
Meyersohn, "Inaug. Diss.," Würzburg, 1901.	7 years	,,	R.	Recurr. in 2 mths.	...
Lilienthal, *Jahresb. u. Chir.*, 1897.	2¾ ,,	Round-celled sarcoma.	,,	?	...
Kablukow, *ibid.*, 1898 ., .	...	Sarcoma.	,,	?	...
v. Recklinghausen, *Deutsche med. Wchnschr.*, Leipzig, 1898, No. 9.	2¼ years	Adeno-sarcoma.	,,	?	...
Braatz, *Deutsche Ztschr. f. Chir.*, Leipzig, 1898, Bd. xlviii.	21 mths.	Adeno-myo-sarcoma.	,,	Recurr. in 3 mths.	...
Hellmich, "Inaug. Diss.," Kiel, 1901.	2 years	Adeno-sarcoma.	,,	Recurr. in few months.	Yes.
Cuno and Trappe, *Deutsche med. Wchnschr.*, Leipzig, Bd. xxxii. S. 105.	3 ,,	Adeno-sarcoma, cartilage, and muscle.	,,	Well, 6 mths. later.	...
Kynoch, *Lancet*, London, 1898, vol. ii. p. 746.	14 mths.	Adeno-sarcoma.	,,	Well, 2½ years later.	...
Morton, *Brit. Med. Journ.*, London, 1900, February 3.	18 ,,	,,	,,	Recurr. in 5 mths.	...
Salzwedel, *Berl. klin. Wchnschr.*, 1902, July 28.	...	,,	,,	?	...
Schönstadt, *ibid.*, 1901, September 30.	6 mths.	Embryonal adeno-sarcoma.	,,	Well, 10 mths. later.	...
Busse, *Virchow's Archiv*, 1899, Bd. clvi. S. 356.	5 years	,,	,,	Recurr. in 2 mths.	Yes.
Do., *ibid.*	3 ,,	,,	,,	?	No.
Do., *ibid.*	4 ,,	,,	,,	Recurr. in 4 mths.	No. Albumin
Do., *ibid.*	6 ,,	,,	,,	Recurr. in 1 mth.	...

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[1] Measles.

[Table I.—*continued.*

Reference.	Age.	Structure.	Operation Result.	Final Result.	Hæmaturia.
Merkel, "Inaug. Diss.," Erlangen, 1897.	6 mths.	Rhabdo-myo-sarcoma.	D.	...	...
Kammerer, *Ann. Surg.*, St. Louis, vol. xl. p. 260.	6 years	Sarcoma.	R.	Recurr. early.	...
Dowd, *ibid.*, vol. xl. p. 595 .	6 ,,	Perithelial sarcoma.	,,	?	...
Johnson, *ibid.*, vol. xxix. p. 327.	10 ,,	Myo-chondro-adeno-sarcoma.	,,	Recurr. in 3 mths.	...
Do. *ibid.* . . .	2½ ,,	Round-celled sarcoma.	D.	...	...
Abbe, *ibid.*, vol. xxx. p. 316 .	8 mths.	Sarcoma.	R.	Well, 3 mths. later.	?
Voelcker, "Diagn. der Chir. Nierenkr.," 1906.	4 years	,,	D.	...	?
Le Conte, *Therap. Gaz.*, Phila., 1902, September 15.	3 ,,	Round-celled sarcoma.	R.	Recurr. in 5 mths.[1]	...
Do., *ibid.*	2½ ,,	Sarcoma.	,,	Recurr. in 6 wks.	...
Longard, *Deutsche med. Wchnschr. Vereinsbeil*, Leipzig, 1902, S. 308.	4 ,,	,,	,,	Recurr. in 1 mth.	...
Petit, *Soc. Anat.*, 1902, June.	20 mths.	Rhabdo-myo-sarcoma.	,,	Recurr. in 3 mths.	...
Storp, *Deutsche med. Wchnschr. Vereinsbeil*, Leipzig, 1902, S. 137.	2½ ,,	Adeno-sarcoma.	,,	?	...
Smith, *Cincinnati Lancet*, 1904, April 23.	6 years	Sarcoma.	D.	...	...
Hand, *Phila. Pediat. Soc.*, 1900.	22 mths.	,,	R.	Recurr. in 6 mths.	...
Herzog and Levis, *Am. Journ. Med. Sc.*, Phila., 1900, June.	16 ,,	Adeno-myo-sarcoma.	D.	...	...
Wanitzchek, *Prag. med. Wchnschr.*, 1898, No. 52.	4 years	Sarcoma.	R.	Recurr. in 2½ years and 2nd operation.	...
Chipault, *Presse méd.*, Bruxelles, 1899, May 6.	21 mths.	Spindle-celled sarcoma.	,,	Recurr. in 4 mths.	No.
Schoen, "Inaug. Diss.," Griefswald, 1899.	4 years	Myo-sarcoma.	,,	,,	,,
Coley, *Med. News*, Phila., 1897, October 9.	5 ,,	Sarcoma.	,,	?	...
Heydenreich, *Rév. med. de l'Est.*, Nancy, 1897, January 26.	5 ,,	Spindle-celled sarcoma.	D.	...	...
M'Donald, *Albany med. Ann.*, 1897, May.	3 ,,	Sarcoma.	R.	Recurr. in 5 mths.	...
Praxin, *Wratsch*, 1899, No. 27	9½ mths.	,,	,,	?	...
Webb, *Lancet*, London, 1902, October 18.	6 years	Adeno-sarcoma.	D.	...	No.
Malcolm, *ibid.*, 1902, Nov. 1 .	22 mths.	Malignant adenoma.	R.	Well, 10 years later.	...
Walker, *ibid.*, 1902, Nov. 29 .	3½ years	Sarcoma.	,,	?	No.
Willis, *ibid.*, 1906, March 17 .	4½ ,,	,,	,,	?	Yes.
Hawthorne and Curtis, "Rep. Soc. Study Disease in Children," vol. ii. p. 196.	4 ,,	Adeno-sarcoma.	D.[2]	...	No.
Simon, "Thèse de Paris," 1904	5 ,,	Small-celled sarcoma.	R.	Well, 17 months later.	,,
Leonte, *Ann. Gynec. and Ped.*, Boston, 1897, p. 343.	5 ,,	Sarcoma.	,,	Recurr. in 6 mths.	...

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[1] Incomplete operation.

[2] Died from pleurisy.

[TABLE I.—*continued.*

Reference.	Age.	Structure.	Operation Result.	Final Result.	Hæmaturia.
Charon, *Ann. Soc. belge de chir.*, Bruxelles, 1897–98.	19 mths.	Sarcoma.	D.	...	...
Bittner, *Wien. med. Wchnschr.*, 1897, p. 333.	4 years	,,	R.	?	...
Bloch, *Hosp.-Tid.*, Kjobenh., 1898, No. 34.	13 ,,	,,	,,	Well, 9 mths. later.	Yes.
Brun, *Presse méd. belge*, Bruxelles, 1898, No. 17.	4 ,,	,,	D.	...	...
Do., *ibid.*	2 ,,	Lympho-sarcoma.	R.	Recurr. in 3 mths.	...
Debuchy, *Ann. d. mal. d. org. genito-urin.*, Paris, 1900, S. 436.	3 ,,	Sarcoma.	D.	...	...

Albarran records the results in sixty-three cases recorded between the years 1890 to 1897; if these cases are added to those I have collected dealing with the years 1897 to 1906, a total of 167 cases is obtained, with an immediate mortality of forty, or 23·9 per cent.

Regarding the question of final results, the same general impression of moderate improvement is to be gathered from the records.

In my series of 104 cases, seventy-seven recovered from the operation, and of these there is a further history in fifty-eight (excluding a case of death from intercurrent disease without recurrence). In forty of these death took place from recurrence, leaving eighteen who were well at the time of report. Of these eighteen, nine were well two years after operation, nine were well less than two years later, the average period being eight and a half months.

With regard to recurrence, in the great majority of the cases in which it is recorded it has taken place at an early stage, within a few months after the operation. There are a few notable exceptions to this rule; one of Abbe's cases, for example, died from recurrence in the remaining kidney after a period of four and a half years, and Jessop records death from recurrence after two years and five months. It seems probable that in Abbe's case the second growth was independent; it is well known that in a certain number the disease is bilateral.

The figures just given compare very favourably with those which Walker was able to record in 1897. In his seventy-four operative cases—in thirteen there was a history of freedom from recurrence for a definite period; four were well two years and more later (including Abbe's case, which died later); nine were well less than two years later, the average period recorded being seven months.

The figures may be compared in another manner:

	Well two years later.	Well one year later.
Present records . . .	9	3
Walker's „ . . .	4	2

The number of cases which can be justifiably considered complete recoveries is small. Abbe's case is the only one which I can discover in which recurrence is recorded later than three years after operation; rapid reappearance of growth is the rule in the unsuccessful cases, and the tables show that death from recurrence occurs usually within a few months. Under these circumstances it is justifiable to write down patients who survive the three-year limit as cured.

Walker in 1897 recorded four such cases; Heresco in 1899 recorded four; Albarran and Imbert in 1903 recorded seven. I have been able to find ten such cases, which are shown in Table II., and there are six other cases which have passed the two years' limit without recurrence. The encouragement to be derived from this table is not great, but the results are not so desperately bad as would be gathered from the figures given by some writers. Those given in Bland Sutton's "Tumours" (4th edition, 1906), for example, do not convey an accurate idea of the final results.

It would serve no purpose, even if it were possible, to collect all recorded cases in order to estimate the percentage of known final recoveries. The results, both immediate and final, vary considerably in the case of different surgeons. Jordan in 1895 recorded nine cases operated on by Czerny since 1889, all of which recovered from the operation; Israel records two final recoveries in seven cases, with recovery from operation in all.

A glance at Table II. shows that there is the best prospect of final recovery in the case of infants, ten of the sixteen cases which survived operation for two years were under twenty months of age.

Operation should be undertaken in these cases of renal sarcoma, unless there are signs of metastasis or pronounced cachexia. Large size of the growth is no bar to operation; many of the largest removed have presented no particular difficulty to the operator. Extreme youth of the patient is rather in favour of than against operation, as not only do young infants appear to stand the operation well, but the prospect of cure is greater, generally speaking, the younger the child.

With regard to the operation itself, little need be said. The incision commencing in the loin and coming forwards to the outer border of the rectus muscle is the one to be preferred. I attach no importance to the opening of the peritoneal cavity,—in growths of considerable size it is necessary; when by doing so better access can be got to the growth, there is no reason why it should be avoided.

TABLE II.—*Cases Well without Recurrence Two Years after Operation.*

Reference.	Age.	Structure of Growth.	Period after Operation.	Remarks.
Israel, *Chir. klin. d. Nierenkr.*, 1901.	14 years	Alveolar sarcoma.	11 years.	Extra - peritoneal nephrectomy.
Malcolm, "Tumours," Bland Sutton, 1906, p. 109.	20 mths.	Sarcoma.	10 ,,	...
Israel, *Chir. klin. d. Nierenkr.*, 1901.	6 years	Spindle - celled sarcoma.	7½ ,,	Hæmaturia, early.
Döderlein, *Centralbl. f. d. krank. d. Harn. u. Sex.-Org.*, Leipzig, 1894, Hefte 1 and 2.	7 ,,	Adeno-myxo-sarcoma.	5 ,,	No hæmaturia, transperitoneal nephrectomy.
Abbe, *Ann. Surg.*, St. Louis, vol. xxvii. p. 364.	2½ ,,	Adeno - sarcoma.	5 ,,	Hæmaturia once; transperitoneal nephrectomy.
Küster, *Ren. Geiss. Achtzehn. Jahre. Nierenchir.*, Marburg, 1900.	9 mths.	Carcinoma.	4 ,,	Hæmaturia.
Bastianelli, *Clin. Chir.*, Milan, 1905, tomo xiii. p. 1321.	14 years	Myxo-sarcoma.	4 ,,	Transperitoneal nephrectomy.
Schmidt, *Centralbl. f. Chir.*, Leipzig, 1893, No. 31.	6 mths.	...	3 ,,	,, ,,
Muus, *Virchow's Archiv*, Bd. clv. S. 401.	9 ,,	Embryonal adeno-sarcoma.	3 ,,	Lumbar nephrectomy.
Warthin, Ref., Albarran et Imbert, "Les Tumeurs du Rein," 1903, p. 447.	13 ,,	Hypernephroma.	3 ,,	...
Kynoch, *Lancet*, London, 1898, vol. ii. p. 746.	14 ,,	Adeno-sarcoma.	2½ ,,	...
Schend, Ref., Simon, "Tumeurs solides du rein.," "Thèse de Paris," 1904.	6 ,,	Sarcoma.	2½ ,,	Transperitoneal nephrectomy.
Rovsing, Ref., Heresco, "Thèse de Paris," 1899.	8 ,,	,,	2 ,, 3 mths.	Lumbo - peritoneal nephrectomy.
Piccard, *Kansas Med. Journ.*, 1895.	4 years	,,	2 years	...
Concetti, *Riforma med.*, Roma, 1898, tomo ii. p. 361.	11 mths.	Myxo-sarcoma.	2 ,,	Abdominal nephrectomy.
Steele, *Med. and Surg. Rep.*, Phila., 1896, vol. lxxiv.	16 ,,	Melano-sarcoma.	2 ,,	,, ,,

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

◆

Chirurgische Operationslehre. Von Dr. TH. KOCHER. Fünfte Vielfach Umgearbeitete Auflage. Jena: Gustav Fischer.

THE genius and the industry of the great Bernese surgeon have never been demonstrated in a more striking form than in this the latest edition of his "Operationslehre." The disciples of Kocher, in spite of the fact that they have become accustomed to find new fields of surgical enterprise revealed with generous profusion in each succeeding edition of his classical work, will be astounded at the amount of new material which has been incorporated in the present issue, and at the extent to which the contents have been rearranged and reconstructed. There have been detractors of Kocher's work in its original form on the ground of its not covering the entire field of operative surgery; these will now have to hold their peace, for all noticeable gaps, such as the operation for cleft palate and for cancer of the penis, have now been filled, and the book is complete.

As in former editions, the sequence of instruction proceeds by way of the preparation of the patient, and of the armamentarium of the surgeon to the subjects of anæsthesia and wound technique. The former of these is considered in great detail, the common measures employed for the production of local and regional analgesia coming in for a large share of attention, and it may be here noted that the author entertains no bias in favour of the intra-spinal method. Continuous sutures of antiseptic silk are again pronounced to be the best and the simplest, and the surgeon who cannot depend upon them "has usually grounds for doubting the reliability of his asepsis."

The "Surgery of the Circulation" is the first of the new divisions of the work, and when it is mentioned that the list of operations in the Table of Contents under this head covers two pages and a half, with no less than twenty-two operations on the veins alone, some idea will be gained of the additions which have been made to the book under this head alone.

The "Surgery of the Nervous System" is another of the new divisions, with two and three-quarter pages in the Table of Contents, while the list of operations on the peripheral nerves shows that scarcely one is exempt from surgical interference.

The "Surgery of the Extremities" is a new division, which permits of the introduction of matter concerning the operative treatment of paralysis and deformities, and the description of arthrotomies, resections, and amputations on a more satisfactory and systematic basis.

The remaining divisions resemble those in former editions of the work, but many new sections have been introduced completing the scope of the book, as has been already indicated.

The evolution of Kocher's "Operationslehre" is not to be gauged by the additional number of pages and of illustrations, but by the reconsideration and reorganisation of every subject coming within the sphere of the operating surgeon.

We know of no single work produced by any living surgeon which affords such testimony to the unique reputation of its author, who may be truly described as the greatest teacher of the subject the world has up till now produced.

A System of Medicine. Edited by T. C. ALLBUTT and H. D. ROLLESTON. Vol. II. Part 2: "Tropical Diseases and Animal Parasites." London: Macmillan & Co.

BY a happily devised rearrangement of the contents of the various volumes of this well-known standard work, the volume under consideration as it now stands is devoted exclusively to tropical diseases and animal parasites, and as the subjects are treated in the exhaustive manner characteristic of this system of medicine, with the matter thoroughly up to date, it will be eagerly welcomed by all interested in these branches of medicine.

After an introduction by Manson, about 200 pages are occupied by contributions on "Protozoa," "Mosquitoes," "Blood-sucking and other Flies," and "Ticks," by Minchin, Theobald, Austen, and Pocock respectively. The article on the "Protozoa" is profusely illustrated, and is by far the most comprehensive which has hitherto appeared in any medical work.

Tropical diseases have been entrusted to many writers whose names may, on the whole, be accepted as a guarantee of the excellence of the articles for which they are responsible. There is a noticeable lack of illustrations in this portion of the book—only three in about 600 pages—and while some of the articles are somewhat spun out, the space allotted to some important subjects, malaria, for instance, is somewhat inadequate, and the articles bear evidence of the efforts of the writers to keep within the space placed at their disposal.

With reference to a paragraph on p. 746, it may be pointed out that although the name "Dhobie itch" is in common use by various authors in this country, and has even found its way into the "nomenclature of diseases," it is absolutely ungrammatical. One does not speak of "writer cramp" or "housemaid knee." The correct term, invariably employed in India, is "Dhobie's itch."

The section on "Animal Parasites," by Bulloch, Manson, Shipley, Sandwith, and Stirling, is one of the best parts of the book, many more or less inaccurate figures which have done duty for many years in various works having been replaced by more accurate illustrations.

The editors are to be congratulated on the production of an excellent work, which, containing in a compact form such a mass of information with copious references to the literature on the various subjects, should prove invaluable not only to students of tropical medicine, but to practitioners at home and abroad.

Outlines of Human Embryology: A Medical Students' Handbook of Embryology. By GEORGE REESE SATTERLEE, M.A., M.D. New York: John Wiley & Sons; London: Chapman & Hall Ltd.

THIS work, while not so full or so accurate as Dr. Keith's book upon the same subject, seems to us in many respects well adapted to the needs of the medical student. It is a good idea to draw special attention, as is done at the ends of certain chapters, to the causes of congenital malformations, as elucidated by the study of their developmental history. The book is provided with a full glossary, which should prove useful to those who are not familiar with various terms in current use in most works on biology.

Unfortunately, however, statements occur both in the glossary and in the body of the work which are calculated to mislead, and in a few cases are positively incorrect. Thus "parthenogenesis" is defined as though it were identical with "asexual reproduction," and is stated to occur "without the intervention of the germ cells." Parthenogenesis is, of course, in reality the development of the female germ cell without the intervention of the male. It does not occur so far as is known in *hydra* (as it is stated to do in the book), this animal reproducing asexually (*i.e.*, by fission or budding) as well as by the normal sexual method. Again, the corpus luteum is defined as "the body formed by the production of new tissue and lutein cells in the corpus hæmorrhagicum," whereas the discharged follicle does not necessarily give rise to a corpus hæmorrhagicum, and in some mammals never does so. Further, it is not always clear whether certain statements apply to animals or to the human subject or to both. Thus it is said that "ovulation is as a rule spontaneous, but may be augmented by the presence of the male or precipitated by copulation. As a rule, the two ovaries supply ova alternately." If these statements are intended to apply to animals, the former one is only partly true, and the latter is certainly inaccurate, while it cannot be maintained that anything is really known about the human female in regard to these points. "Multiple pregnancy" does not appear to us to be a very lucid description of "superfetation." Nor is it quite clear how *Amphioxus* can be "studied as a type of mammalian segmentation." "Anlages," which is consistently used as the plural of the German word "anlage," is a trifling error. It only remains to be added that such mistakes as those mentioned, whilst somewhat irritating, do not detract seriously from the usefulness of the book as a whole.

Elementary Manual of Regional Topographical Dermatology. By R. SABOURAUD, Director of the City of Paris Dermatological Laboratory, St. Louis Hospital. English Translation by C. F. MARSHALL. London: Rebman.

THE English version of this meritorious work of Sabouraud's has followed the publication of the original in French with unusual speed, and yet manifests no evidence of hurry in its execution. Dr. Marshall has succeeded in rendering it into excellent vernacular, and thus made readily perusable by readers on this side of the Channel, it will be cordially welcomed by the profession at large, to whom its distinguished author's name is a more than sufficient introduction. It possesses a value peculiar to itself. The descriptions of disease are singularly terse and lifelike. With a few strokes of the pen, its composer causes the ailment under consideration to rise visibly before one's eyes, and the reality of the impression is aided by many admirable illustrations in black and white, which in numerous instances hardly need the additional element of colour to bring out the resemblance. The construction of this book differs materially from that of other treatises on the same subject. The difficulties of classification are avoided by a regional arrangement. Thus all the disorders of the skin affecting the face are grouped together. First, these are enumerated and briefly defined and described, this forming the initial assistance in arriving at a diagnosis. Then a concise account is given of each, supplementary to, and in augmentation of, the primary one. The causes, so far as ascertained, are stated, and the treatment sketched, including the prescription of varied formulæ, in which the English equivalents of the French metric system are clearly put down. Of course, this necessitates repetition of the characters of the disease in all the localities where it may occur; but, when such is called for, iteration is restricted as much as possible by a very complete method of cross references. Taken as a whole, the work somewhat reminds us of a series of dinner menus, with the adapted directions to the culinary artist for preparing them; and, viewed in this light, both, in our eyes, would have the same fault or defect, namely, that while the variety of articles submitted is abundant, the quantity is scarcely satisfying enough. The plan of indexing, too, is hardly sufficient even for an elementary manual, which is all that this claims to be. It consists of a number of diagrams of the several parts of the body, having numerals attached indicating the page where the ailments of that area are dealt with. Thus, for those of the scalp in the child, we are referred to p. 174; of the adult, to p. 206; and of the same in mature age, to p. 232. There are, however, diseases common to many parts indifferently, and these are relegated to the end of the volume as generalised dermatoses, and are considered under the classification of Plenck and Willan, assuming the originating lesion as the basis. This plan occasions at times the aggregation of motley members, as pityriasis versicolor and pityriasis rosea once more find themselves companions, and so likewise blastomycosis, botriomycosis, and keloid. Ingenious as may be the diagrammatic and valuable the classified arrangement, there can be no doubt that an ordinary alphabetical index would have been a most serviceable supplement, and have greatly enhanced the usefulness of the book. It has unquestionably its own place from the instructional point of view; the verdict as to its practical utility must come from the general practitioner, for whose use it is intended.

A Manual of Normal Histology and Organography. By Charles Hill, Ph.D., M.D., Assistant Professor of Histology and Embryology at the North-Western University Medical School, Chicago. Philadelphia and London: W. B. Saunders Company.

We have read this book with considerable pleasure. If we ignore Americanisms, it is well written, and it is also well illustrated. The manual is intended for beginners, and, besides giving an account of the structure of tissues and organs, there are some brief but good directions for laboratory work.

An excellent feature is the large number of references to the relationship of normal histology to pathology and clinical work. We could wish that this departure were more frequent in text-books on the earlier subjects of the medical curriculum. The junior student may not entirely appreciate all the references, but they interest him, and introduce some life into the dry bones of anatomical fact, and undoubtedly help to make the teaching of the more advanced subjects easier and more effective. We take exception to some misstatements in this book, but they are not sufficiently numerous to detract seriously from its excellence. The diagram on p. 107 will give the student the impression that blood cells of the lymphocyte series have granules similar to those of the neutrophile series. Polynucleated are differentiated from polymorphic leucocytes, although no such variety as the former exists.

On p. 110 the giant cells of bone marrow are confused with the osteoblasts and osteoclasts, which are only found in developing bone, and which are connective tissue cells derived from the periosteum. The uninitiated would have difficulty in following the directions for the use of Wright's stain on p. 439. We are informed on p. 444 that sections do not stain well after fixation in formaline. In our experience, formaline is the fixative *par excellence* in using aniline dyes.

In spite of these imperfections, we would have no hesitation in recommending this volume to a student who wished a book of the kind. At the same time, if we could carry out our ideals, we should like each of our students at the end of a course of histology to write a similar book for himself as the outcome of his daily notes and drawings of his personal observations and practice in methods.

The Evolution of Life. By H. CHARLTON BASTIAN, M.A., M.D., F.R.S.
London: Methuen & Co.

AFTER nearly thirty years, Dr. Charlton Bastian, famous for his controversy with Tyndall and Pasteur on the question of the origin of life from non-living matter, has returned once more to his experiments, and has embodied his results in a new and entertaining book. It will be remembered that the author, in opposition to his two distinguished adversaries, expressed the belief that even in perfectly sterilised media, it was possible for germs of life to reappear under suitable conditions. As a result of his recent experiments, he reiterates his former conclusion, which he now regards as incontestably established. He describes how he prepared some saline solutions, which he closed in hermetically sealed tubes that had previously been sterilised, while, as a further precaution, he subjected the closed tubes to temperatures of from 100° to 130° C., a degree of heat supposed to be fatal to all micro-organisms. Yet after exposing his solutions to diffused light or the uniform heat of an incubator for several months, he claims to have discovered bacteria, vibriones, micrococci, streptococci, torulæ, and other fungus germs in deposits of silicon lying at the bottoms of the tubes. Carbon was not present in the original solutions (excepting possibly as an impurity), but its close chemical ally, silicon, was; so Dr. Bastian concludes that there is good *primâ facie* evidence that silicon is capable of entering into the composition of protoplasm as a complete or partial substitute for carbon. The last supposition is itself sufficiently remarkable, and it is certain that until these results have been confirmed by other impartial observers, Dr. Bastian's conclusions concerning the *de novo* origin of life, no less than his theories of heterogenesis, will be regarded by most biologists with continued scepticism.

Post-Mortem Pathology. By Henry W. Cattell, A.M., M.D. 1906. Third Edition. Philadelphia and London: J. B. Lippincott Co.

The popularity of this book is proved by the fact of its having gone through three editions in almost as many years. There can be no question that it supplied a long-felt want for practitioners who had not themselves much experience in post-mortem work, and who were unable to avail themselves of similar books published in France and Germany. The present edition has been revised, and short chapters on "Plant Pathology" and "Teaching of Post-Mortem Technique" have been added, together with several new illustrations, and recent information in regard to tropical diseases, syphilis, and tuberculosis. The two new chapters contain nothing novel or important, and might well have been dispensed with.

While we fully recognise the value of the book, and regard it as a most useful adjunct to the library of all medical practitioners, yet we think that it might be rendered much more useful for practical purposes by confining the scope of the work strictly to post-mortem technique, together with a description of pathological conditions, and by excluding from it such chapters as those on "Post-Mortem Examinations of the Lower Animals" and "Medico-Legal Suggestions."

The medico-legal suggestions seem to us of very little practical value, inasmuch as they contain a great deal that is irrelevant, and many statements which, to say the least, are open to question, and which are calculated to mislead rather than to assist an examiner in a medico-legal case.

In the earlier part of the volume, when dealing with the external examination of the body, there are certain pronouncements with which we cannot agree. Thus, for example, on p. 58, where it is stated that the discoloration caused by a bruise is due to "extravasated staining of the tissues, and not to the actual presence of blood"; and again, on p. 60, when he states that chronic alcoholism delays and prolongs post-mortem rigidity.

We wonder if the author can substantiate the statement on p. 294 that the sudden death of children is sometimes undoubtedly mechanical, and due to asphyxia, caused by an enlarged thymus pressing on the trachea.

Chapter xxix. gives the Prussian regulations for the performance of autopsies in medico-legal cases, but it is scarcely quite accurate to say that those published in 1875, and which bore the *imprimatur* of Virchow, are still operative, since, three years ago, these were amended and a new "Regulativ" came into force.

A Handbook of Medical Jurisprudence and Toxicology. By WILLIAM A. BREND. London : Charles Griffin & Co. Ltd.

THIS is an excellent little handbook, and we can confidently recommend its use by students who are preparing for examination and have not time to study a larger work, such as that of Dixon Mann.

It does not indicate that the author has much personal experience of medico-legal work, and we have found many statements derived from older works which require modification in the light of later researches. For students' purposes, however, the information given will be found quite sufficient. We cannot agree with the following sentence (p. 73) referring to the differentiation of human blood from that of other animals, either in regard to sufficiency or accuracy:—"A somewhat elaborate process, based upon the toxic effects produced when the blood of one animal is injected into another of different species, is still in the experimental stage. All that the medical examiner can say with certainty at present is that the blood is that of a mammal, or that of a fish, bird, or reptile, and this only when it is sufficiently fresh to contain some normal corpuscles."

The Essentials of Histology, Descriptive and Practical. By Professor E. A. SCHÄFER, LL.D., Sc.D., F.R.S. Seventh Edition. London: Longmans, Green, & Co.

THE seventh edition of such a well-known text-book hardly calls for a detailed review.

Many illustrations have been added, and a new feature is the printing of many of them in colour—a great improvement on previous editions. A considerable addition has been made to the description of the central nervous system, and the book gives a full and clear account of this part of histology, which does not easily lend itself to description. Recent work is adequately noticed. We may refer to the inclusion of a woodcut from Hammar's recent researches on the thymus, and an account of Richard Muir's stain for granules. Professor Schäfer adheres to his view that red-blood cells are formed in "vaso-formative cells" of connective tissue.

By a glance at the diagrams in this book, one may form a good idea of the structure of any of the tissues or organs of the body; and the letterpress provides an excellent description both of the histological appearance of the various structures, and of the best methods of preparing them for microscopic examination. Without being unduly large, the book gives an admirable account of histology, and we know of no better students' text-book.

Notes on Local Anæsthesia in General Surgery. By J. W. STRUTHERS, M.B., F.R.C.S.Ed. Edinburgh: Wm. Green & Sons.

THE author of these notes remarks in the preface that local anæsthesia has been little used, and that its possibilities are not much known in this country. This is only partly true; many surgeons have used it in minor surgery with great success, but we are glad that the belief he entertains has led the author to bring before the profession in a succinct and readable form the value of local anæsthesia and the best way to produce it. Local anæsthesia by infiltration and regional anæsthesia are described, and cases illustrative of their value related, special attention being directed to the former in operations for empyemata. Two cases are quoted, p. 70, in which little pain was felt, but such is not always the case, as not infrequently, although the soft parts are divided without pain, much pain is felt during excision of the rib. Mr. Struthers also alludes, but for practical purposes rather inadequately, to the use of stovaine as a special anæsthetic.

An index would have increased the value of this small work, which should be read not only by surgeons, but by practitioners, in whose practice local anæsthesia should prove most valuable. Mr. Struthers has done a good piece of work, which we trust he will amplify in a future edition.

Text-Book of Comparative General Pathology. By **Professor Kitt.** Translated by Dr. **William W. Cadbury** and Dr. **Allen J. Smith.** London : Baillière, Tindall, & Cox.

This book is an outline of the fundamental facts of pathology, from the special standpoint of the student of veterinary medicine. It does not in any way replace the text-book of Birch-Hirschfeld, and though much space is devoted to pathological anatomy, yet throughout the whole work the physiologist rather than the pathologist is in evidence. The earlier chapters deal with the history of pathology, the defensive mechanisms of the body, and the causes of disease. These are well written, and excellent in their way; but there are many statements which are not in accord with modern investigations. The chapters on the disturbance of circulation and those on the retrograde metamorphoses are brought well up to date. They are rather brief, though for the student for whom the book is intended this may be an advantage. The best part of the book is that dealing with the processes of repair and new formation. These chapters are very evidently the work of an expert, and we most heartily commend them not only to students of veterinary pathology, but also to those of human pathology.

We cannot, however, speak in praise of the latter chapters of the book, those dealt with under the title of "Functional Abnormalities." Too much has been attempted, and, as a result, we feel that the book would have been improved if this part had been omitted. There is quite enough material in the last forty pages to make another volume.

The book is very readable; the illustrations are good, and add considerably to its value.

Though we would hesitate to recommend it as a text-book for students, yet it must be considered as a valuable aid to other books; and to any graduate in veterinary medicine the book should prove of extreme interest and of no small value.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
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TETANY: ITS RELATION TO THE PARATHYROIDS.

In most countries tetany is reckoned among the comparatively rare disorders, but in Vienna, for some reason, it is by no means uncommon. In that city its prevalence is such as almost to warrant the term endemic being applied to it, and from time to time epidemics of it occur, particularly among workers at certain trades. Such outbreaks were very frequent in the nineties, and have given rise to much discussion as to their cause. The writer of this abstract heard the view expressed at that time that the spread of tetany among female operatives was due to imitation or hysteria. Professor Chvostek is well known as an authority on the disease, and has recently (*Wien. klin. Wchnschr.*, 1907, April 25 and May 3) taken up the subject anew in a paper on the "Etiology of Tetany." The view he expresses, that the disease is due to interference with the function of the parathyroids, is not altogether new; he gave utterance to it two years ago, and since then, notwithstanding a good deal of investigation, the correctness or otherwise of his theory is still disputed. Chvostek's first point is that the symptom-complex known as tetany is so constant, though varying in severity, that it is entitled to be regarded as a disease *per se*, and that it should no longer be classified as idiopathic and secondary (*e.g.*, to gastric dilatation, various intoxications, pregnancy, etc.). Under whatever conditions it arises, it is the same malady—idiopathic tetany being indistinguishable from that of stomach disorder, and the like. He next devotes considerable space to the value of the sign (facial irritability) to which his name has by consent been attached in the diagnosis of latent and manifest tetany. Latterly there has been a tendency to argue that Chvostek's sign occurs with sufficient frequency in healthy persons, and in connection with other diseases, to deprive it of pathognomonic value. Chvostek analyses the statistics which have been published, and records his own fresh investigations on this point, and shows that when account is taken only of the sign as he originally described it, *i.e.* a twitching of the lip and ala of the nose on tapping the skin below the zygomatic arch, the phenomenon is very rare apart from tetany. He notes that the series of observations on healthy persons in which it was found most frequently was made in Vienna at a time when a tetany "epidemic" prevailed. He admits that minor degrees of facial irritability, such as a slight contraction of the red of the lips, are not very rarely met with, and are not diagnostic of tetany, but cannot agree with those who on this account dispute the pathognomonic character of the fully developed sign. The next matter raised is the cause, ultimate and proximate, of tetany. The ultimate cause must be either a specific exciting agent, or some disturbance of the functions of an organ. Now, tetany has been found to arise under a great variety of conditions—auto-intoxication, pregnancy, after thyroidectomy, in certain trades, etc. No one has succeeded in discovering any poison which will produce tetany; hence Chvostek prefers the second alternative, namely, that certain individuals are predisposed to the disease, by reason of disturbed function of some organ, and that where this predisposition exists, any of the known exciting causes—cold, over-exertion, auto-intoxications, etc.—will produce the attacks. The organ of which the function is at fault is, Chvostek believes, the parathyroid gland. This opinion rests partly on the experiments of Pineles, who succeeded by extirpating these structures in animals in producing tetany and increased mechanical irritability of nerve and muscle. This throws light on the occasional occurrence of facial irritability during pregnancy and menstruation, in anæmia, and in diseases of the female reproductive organs; for we have plenty of evidence that the generative and other glands are functionally related to one another. Facial irritability is also relatively common in phthisis. Chvostek suggests that this is due to the proximity of the lower part of the parathyroid gland to the apex of the lung, and he quotes a case of phthisis with facial irritability in which tuberculous deposits were found in the glands. Mechanical irritability, therefore, in phthisis is not merely a sign of latent tetany, but an evidence of disturbance of parathyroid function. Turning again to the results of animal experiment, he points out that the variability of the consequences of extirpation of the parathyroids in different species is no greater than the variability of the symptoms of tetany in various individuals. Clinically, fatal tetany is the same, whether it follows thyroidectomy or occurs in the course of gastric dilatation or pregnancy, and chronic tetany from thyroid insufficiency is exactly like chronic relapsing "worker's" tetany. In addition to the experimental evidence that pure thyroid lesion alone does not cause the disease, changes have been found in the parathyroids —hæmorrhage in a case of infantile tetany, signs of hyperplasia in a case of gastric tetany, tubercle, as referred to above, and, in a fourth case, abnormal staining reactions. It is not supposed, however, that a gross lesion is always present; mere insufficiency, in the presence of which some passing cause—a sore throat, cold, etc.—precipitates an attack, which rapidly subsides on rest in bed, is enough. The insufficiency may be so slight as only to reveal itself by facial irritability, or at some special time; for instance, during menstruation. Even in fatal tetany it is probable that death is due rather to the other disease present

—gastric dilatation, etc.—than to parathyroid inadequacy. Chvostek found that in chronic latent tetany, in patients who had had an attack and had recovered from it, he could produce a seizure at any time by giving an injection of tuberculin sufficient to cause a febrile reaction. The epidemic occurrence of the disease in the spring Chvostek ascribes to the prevalence of catarrhal conditions, sore throats, and febrile attacks at that time. The special incidence of the disease in an epidemic form among certain trades he accounts for on the theory that from time to time pressure of work throws an extra strain on the operatives, and that then tetany occurs among those with inadequate parathyroids.

In this paper Chvostek does not give details of the experiments on which his theory is in part based; these are more fully dealt with in his earlier communication (*Wien. klin. Wchnschr.*, 1905, No. 38). Vassalé and Generalé in 1896 showed that thyroidectomy caused cachexia, removal of the parathyroids, tetany. Pineles in 1904 showed that the effects of thyroid aplasia were comprised under the phenomena of myxœdema and cretinism, and proved that on cats (as Vassalé had done on dogs) parathyroidectomy caused acute tetany, and in apes a more chronic form of the disease. Partial removal of the parathyroids was not followed by tetany, even when the whole thyroid was also excised (Pineles and Biedl). In support of the view that tetany is due to parathyroid insufficiency, Chvostek also draws attention to certain facts connected with its geographical distribution, which presents analogies to the distribution of goitre. In localities where either goitre or tetany is endemic, the number of cases fluctuates greatly from year to year, and there may be long intervals in which none occur. Tetany was formerly very prevalent in Moscow and Paris; now it is a rarity in these towns. Vienna and Heidelberg are the only cities in which it is now endemic. It is well known that persons going to reside in a goitrous region readily develop goitre; the same thing is observed in regard to tetany. The majority of the Viennese cases occur among Slav immigrants. There appears to be some antagonism between the two diseases, for tetany is rare in goitrous districts, and goitre rare where tetany is endemic. In Vienna, where tetany is declining, goitre is becoming more frequent. These analogies suggest that the two diseases have the same kind of origin, affecting the thyroid and parathyroid respectively, though what its nature is is unknown in both cases.

The function of the parathyroids forms the subject of an experimental and critical study by Caro (*Mitth. a. d. Grenzgebiet. d. Med. u. Chir.*, Jena, 1907, Bd. xvii. Heft 304). The first part of the communication is a criticism of Pineles' experiments. Caro says that in Pineles' two monkeys, which died of tetany after extirpation of the parathyroids, it is not proved the thyroid was uninjured by the operation. In another of Pineles' monkeys from which the thyroid and parathyroids were supposed to have been removed, tetany did not follow, and on post-mortem examination it was found that a small piece of thyroid, but no parathyroid, had been left behind. Similar criticism is brought against the observations that cats took tetany after parathyroidectomy, Caro asserting that there is no proof that sufficient thyroid was left behind. A further point made by Pineles is that tetany does not follow thyroidectomy when parts of the lateral lobes of the gland (*i.e.*, including the parathyroids) are left, but Caro reasons that the absence of microscopic examination of the tissues removed and remaining deprives the argument of weight. It seems that in Berne myxœdema is a more frequent sequel of ablation of the thyroid than is tetany, while in Vienna the reverse obtains. Kocher performs extra-capsular, and the followers of Billroth intra-capsular, removal of the gland; so that in the latter school the parathyroids are less likely to be injured, yet tetany occurs more frequently than myxœdema. Caro therefore regards Pineles' thesis as unproven. He then gives details of his own experiments. After removal of a great part of the thyroid and all the parathyroids from dogs, tetany occurs unless a definite minimum amount of thyroid is left. When the residue of the gland is subsequently extirpated, death follows with tetany and nephritis. During the interval between the two operations the remnant of thyroid hypertrophies to double its size. Caro examined the tissues microscopically, and was satisfied that the structure was thyroid, not parathyroid, gland. He also satisfied himself as to the completeness of the removal of thyroid and parathyroids. He regards these experiments as demonstrating that retention of a part of the thyroid prevents tetany, and that its removal produces the disease. With the idea of throwing some light on the physiology of the thyroid enlargement of pregnancy, he compared the effects of partial extirpation on pregnant and non-pregnant animals (dogs and cats). Many pregnant dogs tolerated as extensive removal of the thyroid and parathyroids as non-pregnant animals did, neither the progress of gestation nor the general health suffering; in only a few were transient cramps observed. It thus seems that in pregnancy, as a rule, there is no increased demand on thyroid activity, but that individual requirements in this respect vary. From the clinical side, Caro quotes cases of thyroidectomy in pregnant women in whom the course of gestation was undisturbed, and tetany slight or absent. In some of Caro's animals nephritis developed after thyroidectomy. He therefore tried the experiment of removing a kidney, and after the animal had recovered from the effects of this, ablating part of the thyroid; the results, however, were negative. Caro's conclusion is that there is no evidence that parathyroid insufficiency plays any part in the production of tetany. It ought perhaps to be said, however, that while his negative results must be given due weight, his criticisms of Pineles' experiments do not strike one as very convincing.

Howard's paper on Tetany (*Am. Journ. Med. Sc.*, Phila., 1906, February) deals with the subject generally. One of his cases was benefited by feeding with parathyroid extract. His figures are of interest in relation to the distribution of tetany: Vienna, 0·7 per cent. of cases attending the neurological clinique; Berlin, 0·1 per cent.; up to 1905 only 154 cases reported in America; of admissions to medical wards, Johns Hopkins Hospital, 0·05 per cent. In certain German towns, where shoemakers comprise 1·3 per cent. of the population, 43 per cent. of cases of tetany belonged to this class.

SURGERY.

UNDER THE CHARGE OF

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On Benign Cysts of the Long Bones.

In reporting a series of cases of benign cysts of the long bones, Robert Jones and David Morgan (*Arch. of Röntgen Ray and Allied Phenomena*, London, 1907, April–May) give an instructive résumé of the literature of this subject. These cysts are comparatively rare, and it would appear that, including the authors' cases, the recorded examples number something under fifty. Over 80 per cent. of the cases have been met with in patients under 30—a point of some clinical importance, because as this is the age period of sarcomata, the differential diagnosis is often difficult. The etiology of the condition seems to vary in different cases: it may be due to liquefaction of misplaced islands of epiphysial cartilage (Virchow), to traumatic hæmorrhage into the bone leading to cyst formation, and it has occurred in association with ostitis deformans, osteo-malacia, and the ostitis fibrosa of Recklinghausen. The clinical features are so indefinite that the differential diagnosis, even with the use of the X-rays, is often extremely difficult, and a number of the recorded cases have only been recognised after an exploratory incision has been made into the cyst.

The authors point out that bone cysts may be mistaken for chronic abscess, for specific dactylitis, for rheumatoid enlargements, for callus following a fracture without displacement, for localised periostitis, for ostitis, for central necrosis, and for malignant tumours undergoing cystic degeneration. In most of these conditions the diagnosis is completed by the use of the X-rays, but, in some, radiography does not give so much help—for example, in chronic abscess, tuberculous or otherwise, and in localised osteo-myelitis. In chronic abscess there is not so much an expansion of bone with thinned edges, as a thickening of bone surrounding the excavated area. In osteo-myelitis, although there are translucent areas, the cavity is often irregular, with dark mottling revealing the jagged, necrotic thickening of bone. In tubercle the softening is not sharply bounded by the epiphysial line, as it is in a benign cyst situated at the articular end of the bone. The most important point in diagnosis is to distinguish between an innocent and a malignant tumour. When the bone is so expanded as to produce egg-shell crackling, the tumour is either a sarcoma, an innocent medullary cyst, or an expanding benign tumour, fluid or semi-solid. The X-rays are helpful in distinguishing between these, although they cannot be implicitly relied upon. In the benign cyst the edge of the bone is more definitely marked, less irregular, and suggests a thinning which, starting from the centre of the bone, expands very equally in all directions; the mottling is very slight, and the translucency is definite to its very circumference. If it occurs in the end of a bone, the epiphysial line is not invaded. In osteo-sarcoma the expansion is uneven, the cavity more honeycombed, less translucent, the edges more irregular, and the growth usually invades one side of the bone more than the other.

In the three cases reported by the authors, the treatment consisted in opening up the bone, removing the contents of the cyst and any lining membrane which was present, packing the cavity and allowing it to granulate. In all, the results were satisfactory. The paper is illustrated by a series of photographs and radiographic reproductions.

GAMPSODACTYLIE—A DEFORMITY OF THE TOES.

UNDER the term "Gampsodactylie," Chevrier (*Arch. gén. de méd.*, Paris, 1907, March) describes in great detail a deformity of the toes, which is characterised by hyper-extension of the first phalanx on the metatarsal and flexion of the other two phalanges. In its typical form it affects all the five toes, and very frequently both feet are involved, although the condition may be more marked on one side than on the other. The foot is usually shorter than normal, and appears to be broadened out at the level of its anterior part, as if by separation of the heads of the metatarsals. Over the most salient part of the angle formed by the phalanges a callosity forms, and sometimes a double row of corns is found across the toes. The degree of deformity is not equally marked in all the toes, but usually increases in severity from within outwards, so that the fifth toe is the most crooked. The little toe tends to become deviated laterally, so that it assumes a varus position, while the great toe assumes a valgus position. On the dorsum of the foot the extensor tendons stand out as salient cords, which are most prominent where the tendon is inserted into the first phalanx. In addition to these changes (which appear to resemble closely those of hammer-toe), Chevrier draws special attention to the presence of a prominent tense band on the plantar aspect, which binds the pad under the terminal phalanx to the skin of the sole, and so prevents the straightening out of the toes. This fibrous band is quite superficial, and is entirely independent of the flexor tendons, which can be felt in their osteo-fibrous grooves on a deeper plane. The metatarso-phalangeal joint is usually unimpaired and freely movable; the inter-phalangeal joints can be moved in the direction of flexion, but not of extension, the obstacle to movement being the fibrous band above referred to. A radiogram, taken from the dorsal aspect, shows that the articular ends of the bones are not appreciably deformed; there is no ankylosis, nor is there any dislocation of the joints; but the heads of the metatarsals appear to be separated from one another, which accounts for the broadening of the foot at this level.

The condition gives rise to little functional disturbance beyond weakness of the foot, so that the patient walks slowly and is easily tired. It appears to be more common in males than in females.

In the few cases which call for surgical treatment, it is necessary to divide not only the shortened extensor tendons but also the fibrous bands on the plantar aspects of the toes.

THE OPERATIVE TREATMENT OF TRIFACIAL NEURALGIA.

MARTIN of Baltimore (*Ann. Surg.*, Phila., 1907, May) reports eight cases in which he has performed the complete operation of removal of the Gasserian ganglion for this condition. He operates by a method very similar to that of Cushing, dividing the zygoma, and discarding the osteo-plastic flap. It seems to be pretty definitely settled that total removal of the ganglion is followed by permanent cessation of pain, as no peripheral regeneration of the system of sensory neurons takes place. In almost all the author's cases there have been temporary eye symptoms. If excessive hæmorrhage is avoided, the operation is not necessarily attended with serious shock, and the patient makes an astonishingly rapid recovery. The author does not lay special importance on *removing* the ganglion, so long as the sensory root is divided posterior to it, and the ganglion is so displaced that reunion is impossible. The actual pulling out of the ganglion may be attended by serious hæmorrhage—for example, by tearing into the cavernous sinus. The operation is necessarily a slow one, and in Martin's experience lasts "a number of hours."

TENDONS OF ARCTIC SEA ANIMALS AS SUTURE MATERIAL.

WHILE on a trip to the Arctic regions with Commander Peary, Nicholas Senn ("Military Surgeon," Carlisle, Pennsylvania, 1907) observed that the Eskimo women made the threads with which they sew their skin garments out of the long, broad tendon which lies along each side of the spine in the narwhal. The idea occurred to him that this material might have certain advantages over catgut as a suture material, and he procured some of the tendon and prepared it by the iodine process. Having used it in more than fifty cases, he reports that only in one case did a stitch abscess form, and this could be traced to careless handling of the sutures. He studied the time of absorption of the material, and found that at the end of one week the sutures showed but slight changes from absorption; at the end of two weeks they were still firm; and at the end of three weeks they had undergone advanced absorption, but were strong enough to hold the parts they embraced in accurate coaptation. Senn strongly recommends this material as a substitute for catgut.

A NEW METHOD OF LIGATURING THE INNOMINATE ARTERY OR THE SUBCLAVIAN ARTERY AT ITS ORIGIN.

RYDYGIER (*Wien. klin. Wchnschr.*, 1906, No. 50) suggests a method for exposing the innominate artery which gives a much freer exposure of the vessel than the methods hitherto practised. It may be described briefly as an osteo-plastic resection of the manubrium sterni, and is carried out as follows:—An incision is carried along the lower third of the left sterno-mastoid on its inner border, and is prolonged downwards across the sterno-clavicular joint to below the first rib; it is then carried across the sternum with a downward convexity, and from there bends upwards to cross the right clavicle at the junction of its middle and inner thirds, and extends along the lower third of the right sterno-mastoid on its outer border. In deepening the incision the ligaments of the left sterno-clavicular joint are carefully divided, and the cartilage of the first left rib separated from the sternum. A blunt director is then passed behind the sternum at the level of the first intercostal space, and along the canal so made a Gigli saw is passed, and the sternum sawn through obliquely from above and behind, downwards and forwards. The first rib and clavicle are then divided in the line of the incision on the right side. In this way a large flap of bone and soft parts can be readily detached and thrown up, exposing the upper part of the aortic arch with the vessels arising from it. After the ligature has been applied, the flap may be replaced and stitched in position without difficulty.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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PUERPERAL ECLAMPSIA.

ENGELMANN (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 11) reports the following severe case of puerperal convulsions:—P., primipara, æt. 22, had fits shortly before the onset of labour at full time. Thirty occurred before and shortly after delivery. Five hundred c.c. of blood were removed and 1000 c.c. of saline fluid transfused. There was a cessation of the fits for four days, when no fewer than 155 fits occurred in twenty-eight hours; the pulse-rate varying between 180 and 200. The patient was transfused with 1500 c.c. of saline solution, and 2000 c.c. of blood removed. The fits ceased, but soon after the last attack the patient developed puerperal mania, complicated with broncho-pneumonia. The patient recovered, and at the end of three weeks was discharged convalescent from hospital.

OVARIAN CYST AND PREGNANCY.

MARTIN (*Arch. prov. de chir.*, Paris, 1907, No. 2) reports the case of a primipara, æt. 17, who, at the seventh month of pregnancy, manifested symptoms of a suppurating dermoid cyst of the right ovary. As normal delivery was regarded as impossible, Cæsarean section was performed, followed by removal of the suppurating cyst and then total hysterectomy. Both mother and child recovered. Laparotomy was performed in this case with the view of removing the cyst and allowing the pregnancy to take its course. The presence, however, of a centre of infection, and both ovaries being diseased, rendered it safer to remove the uterus. The author, in referring to other cases of this complication, urges early operation, with the view of preventing torsion or rupture of the cyst, or grave obstruction due to the presence of the cyst.

WHEN TO RISE AFTER DELIVERY.

Pierra (*Province méd.*, Lyon, 1907, March) quotes the opinion of most authorities that, after confinement, rest in bed should be as prolonged as possible, as involution of the uterus is not complete till about three weeks after delivery. But it has been shown that involution is complete by the end of a fortnight, and that too prolonged rest favours pelvic congestion, followed, it may be, by retroversion and subinvolution. The dorsal position favours hypostatic congestion of the uterus, and produces what might be termed hypostatic uterine œdema. Unless contra-indicated, the author advises against the patient remaining in bed after the end of a fortnight.

DIAGNOSIS OF EARLY PREGNANCY.

Ladinski (*Med. Rec.*, N.Y., 1907, April 13) believes it is possible to diagnose intra-uterine pregnancy as early as the fifth or sixth week. He describes a characteristic sign. This is a spot of peculiar softness and elasticity at the junction of the body and cervix in the anterior uterine wall. In cases of backward displacement of the uterus, this area is felt in the posterior uterine wall. The same softness is felt in cases of incomplete abortion and subinvolution, but is not so marked as during actual pregnancy. A soft myoma in the anterior uterine wall gives a similar sign, and the two conditions must be distinguished by bi-manual palpation. Absence of this sign excludes pregnancy, and it is due to extreme vascularity of the uterine wall at the point where it is felt.

ACUTE TORSION OF BOTH FALLOPIAN TUBES.

Michel (*Compt. rend. Soc. d'obst., de gynéc., et de pœdiat. de Paris*, 1907, February) reports the following case:—P., æt. 35, 2-para, was seized with pain in lower abdomen a few days after a menstrual period. Acute appendicitis was diagnosed; the pains subsided, but recurred within six weeks. A swelling was detected in both fornices, which was regarded as probably a retro-uterine hæmatocele. Abdominal section proved the swellings to be dilated and greatly twisted tubes, the right, twisted four times, contained clear fluid, the left had three turns and contained blood. There was no evidence of tubal pregnancy, and the author regarded the primary condition to be salpingitis. Michel amputated the uterus above the cervix, removing the appendages without separating them from the uterus. Patient made a satisfactory recovery.

PROLONGED GESTATION.

Bossi (*Gynäk. Rundschau*, Bd. i. Heft 1) considers that gestation prolonged beyond the usual time of 285 days occurs in about 2·3 per cent. of pregnant women. Certain women appear to be especially prone to the condition, and Bossi has noted that it is most frequent during the months of March, April, and May. The features of the condition as regards the child are—(1) Excessive length; (2) enlargement of the head and increased ossification of the cranial bones; (3) weight of the child less than it ought to be in proportion to the other conditions. The effects of prolonged labour are interference with the proper moulding of the head and obstruction from its increased circumference. Bossi has observed fifty-two cases; seven are described in detail in which the gestation period was estimated at 295–305 days. He noted a tendency to inertia of the uterus, due, he thinks, to excessive fatty degeneration of the uterine muscle. The best treatment is the induction of labour by Krause's method.

THE EFFECT OF TRAUMATISM ON THE CONTINUATION OF PREGNANCY.

NEW (*Arch. f. Gynäk.*, Berlin, Bd. lxxx. Heft 2) describes two cases in which intra-uterine death of the fœtus occurred after severe hæmorrhage from small vaginal wounds. In one case the bleeding came from a small eroded varicose vein, in the other after the removal of a small nodule from the vagina. New reports further, a case operated on for acquired atresia at the 2½ month. The operation was followed by severe hæmorrhage, but the patient went to full term. Another patient was delivered at full term after an operation for empyema of the gall bladder at the fifth month.

TWO CASES OF EXCESSIVE UTERINE CONTRACTION OVERCOME BY AMYL NITRITE.

SOUTER (*Australas. Med. Gaz.*, Sydney, vol. xxv. No. 11) reports two cases of tetanic contraction of the uterus as the result of neglected shoulder presentations. Chloroform anæsthesia had no effect in bringing about relaxation of the uterus. Amyl nitrite was given in the first case as an antidote to chloroform, but in the second case it was given deliberately to produce uterine relaxation. In both cases the uterus relaxed to such an extent that intra-uterine manipulations were easily carried out. In neither case did the relaxation continue so long as to cause any post-mortem hæmorrhage.

PUBIOTOMY.

EVANS (*Montreal Med. Journ.*, vol. xxxv. No. 12) reports the following case:—P., æt. 24, 3-para, with a flat rickety pelvis, and conjugate estimated at 8·5 cms., had been delivered by craniotomy in previous labours. Pubiotomy was performed on the left side when labour was in progress by means of a Bumms needle and Gigli saw. The child presented by the breech, and there was some difficulty in delivery of the after-coming head. The pelvic bones separated to the extent of 2 cms. at the time of delivery. Both mother and child recovered. The indications for and technique of the operation are given in detail.

THERAPEUTICS.

UNDER THE CHARGE OF

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A NEW SERUM.

DEUTSCHMANN has prepared a specific serum by injecting increasing doses of yeast into animals. The blood of animals treated in this fashion is more resistant against infection than that of the normal animal. The serum seems to afford a considerable protective action on patients into whom it is injected. It is capable of increasing the resistance of the body against infection with pneumococci, streptococci, staphylococci, etc., or their toxins. The general condition of the patient is improved, and the actual process of the disease is favourably affected and distinctly shortened. This is manifested by the reduction of temperature and the rapid onset of crisis. In the healthy individual the injection of medicinal doses of the serum exerts no influence upon the temperature, but in those suffering from fever due to a microbic infection the temperature is affected in one of two ways. The temperature falls continually from the injection till a maximum fall is reached at the end of six to twelve hours, or there is a preliminary rise of temperature lasting two or three hours, which is then followed by a reduction lasting for three to six hours. It seems characteristic of acute infections that the reduction of temperature is followed by a rise on the following day, which without subsequent injection falls again and remains low. As typical of this action, Deutschmann selects the effect in pneumonia. In a series of twenty-one cases treated by the serum, he found in about one-half of the cases a marked action, shown in reduction of temperature and great improvement in the general condition. Thus, in some cases the injection on the second or fourth day of the disease was followed by an abrupt critical fall of temperature and definite cure. · In the remainder of the cases the course of the disease was not so markedly affected, but there was a fall of temperature on the day of injection, followed in some cases with a rise on the following day. The dose required was about 45 to 60 minims for adults, and 10 to 15 minims for children. In the event of no improvement at the end of the second day the injection can be repeated. Similarly, the serum may be used in cases of severe septic or pyogenic infection, erysipelas, severe influenza, or sore throat. It has been used in a variety of skin diseases, as acne, furunculosis, impetigo, etc. Deutschmann has found it extremely useful in eye cases where there has been a tendency to suppuration. By serum injections he has been able to save eyes threatened with inflammation or suppuration. He uses it also as a prophylactic measure in injuries and operations where there is any suspicion of septic infection. As a prophylactic measure, a single dose of 2 c.c. is sufficient, but for a case of already established inflammation the dose must be repeated, and, if necessary, raised to 3 or 4 c.c.—*München. med. Wchnschr.*, 1907, May 7.

LOCAL USE OF MAGNESIUM SULPHATE SOLUTION IN INFLAMMATION.

Tucker finds that local application of magnesium sulphate rapidly relieves local pain. He has used such application in numerous cases of gonorrhœal epididymitis and orchitis, and finds that the pain is relieved in a few hours. It is not necessary to confine the patients to bed in every case, nor was elevation of the testicles used except to prevent the soiling of the bedclothes. In three cases of gonorrhœal rheumatism the pain was promptly relieved by the local applications, and they may also be used in local sprains and simple contusions. The salt is used in a saturated solution applied on from 15 to 20 thicknesses of ordinary gauze. This is kept saturated by renewal every half-hour at least, to prevent drying up. The gauze is not removed until the end of twenty-four hours. The parts are then washed with water, and the dressing reapplied if indicated. There is then found a marked blanching of the superficial structures, which is not followed by any deleterious effects. The attendants who make the application complain that it causes a partial loss of sensation, accompanied by tingling of the hands and arms, which persists for twelve to twenty-four hours.—*Therap. Gaz.*, Phila., 1907, April.

ADRENALIN IN PLAGUE.

Choksy states that in plague, adrenalin, whether given by the mouth or subcutaneously, exerts a distinctly beneficial action upon the circulation, steadying the heart and increasing pulse tension. It was administered during epidemics in 1905 and 1906 on a large scale, and the results are so far satisfactory that adrenalin proved more useful than stimulant treatment with camphor, atropine, and strychnine. The adrenalin was administered in saline solution 1 : 12, and the amount of adrenalin given was from 20 to 30 minims of the ordinary 1 : 1000 adrenalin solution. The dose is repeated not oftener than every two hours. This treatment is kept up for four or five days, when the dose is reduced gradually. Under this treatment the case mortality fell from 90 per cent. to 71 per cent. Slightly better results were obtained when the adrenalin was given hypodermically than when it was given by the mouth. Thus a series of 102 patients who received 20 minims of adrenalin solution every two hours, or about 200 minims in the day, gave a recovery total of thirty-seven cases, or a case mortality of 63·7 per cent.—*Indian Med. Gaz.*, Calcutta, 1907, February.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Lymphogenous Origin of Toxic Infection of the Central Nervous System.

Drs. Orr and Rows (*Rev. Neurol. and Psychiat.*, Edin., 1907, May) continue their investigation into this subject by a series of clinical and experimental observations. Their former findings may be briefly referred to. In *Brain*, London, 1904, Winter, they described the lesions in the posterior columns of the spinal cord in general paralysis, and pointed out their similarity with those in early tabes. They believed that the circulating poisons passed upwards to the cord in the lymph streams of the nerves, and in their second paper (*Rev. Neurol. and Psychiat.*, Edin., 1906, January) they recorded the results of their examinations in cases of infective brachial neuritis, bed sores, suppurating knee-joint, psoas abcess, and found the lesions they expected in the cord. The poisons pass upwards along the nerves in the lymph stream, the main current of which is at the periphery of the nerve bundles immediately under the fibrous sheath. So long as the nerve fibres preserved their neurilemma they were protected from the action of the poisons. At the point where the neurilemma disappeared, namely, a little outside the constriction of the sensory roots as they pass into the cord, the poison begins to act. It acts, therefore, upon the intra- and not the extramedullary portions of the nerves. Their clinical observations were made upon a series of ten cases, in which the cranial nerves were examined and found to show degenerations of varying degree. In two of the cases there was a septic lesion in the body during life, which seemed to have a direct causal relation with the lesion found in the cranial nerves. In the remaining eight no septic focus was present, and the nerves connected with the pons, and to a less extent those connected with the medulla, were degenerated, the lesion beginning where the fibres lost their neurilemma sheath, and passed into the central nervous system. In no case was there any lesion in the extra pontine parts of the nerves. The lesions were the same in motor and sensory nerves. The degeneration was demonstrated by the Marchi method, and even in the most acute cases, degenerated and healthy fibres lay side by side. The experimental part of their work consisted in their filling celloidin capsules with virulent broth cultures of *Staphylococcus aureus*, *Bacillus coli*, etc., sealing and placing them alongside the exposed sciatic nerve and under the skin of the cheek. Three of the former were successful and two of the latter. Rabbits were used. The action of the toxin is upon the myelin sheath, the distal part of the intramedullary portion of the nerve suffers first, followed by involvement of its whole length back as far as the nucleus of origin, but gradually diminishing in that direction since the toxin loses potency in its progress along the nerve.

In toxic conditions, therefore, primary myelin change is the forerunner of secondary degeneration, whose onset is determined either by the intensity of the toxin or by the duration of its action. Low virulence may thus account for the slow myelin atrophy and degeneration so often met with in many nervous diseases, *e.g.*, tabes dorsalis, in which much myelin degeneration can exist with comparative integrity of the axis-cylinders. Prolonged action in time wears down the resistance, and secondary degeneration ensues.

RECENT RESEARCHES INTO THE EPIDEMIOLOGY OF MALTA FEVER.

COLONEL BRUCE (*Journ. Roy. Army Med. Corps*, London, 1907, March) describes several interesting aspects of the epidemiology of Malta fever.

Geographical distribution.—Its distribution is practically worldwide, but it prevails most at Malta.

Social position.—The higher the social position the greater is the susceptibility to the disease; thus the risk to officers is about three times greater than to the men. This is specially interesting, seeing that the former live in large airy houses, and the latter in the more crowded barrack quarters.

Climate.—This fact, along with its apparent independence of temperature, dust, and moisture, rather contradicts the dust and mosquito propagation theories.

Distribution among civil population.—It occurs in every part of Malta, some of the inland towns showing more cases than the cities round the harbours. This seems to exclude its dependence on sanitary conditions or on the water supply.

Distribution among the garrison.—The soldiers in Malta average 8000, and there is an average yearly incidence in them of 37·6 per 1000, or 312 admissions to hospital every year for Malta fever. In the sailors the incidence is 28·55 per 1000, with a similar number to the soldiers of admissions to the hospital, *i.e.*, 624 admissions yearly, and as each case lasts almost four months, the loss to the two services from this invalidism is enormous.

Path of exit of the micrococcus from the body.—The urine is the chief path. As a rule, their numbers are scanty, ranging from three or four to as many hundreds per c.c.

Vitality and habitat outside the body.—The micrococcus can withstand drying for two or three months. It can live in tap or sea water for about one month, and in urine, which has decomposed and become alkaline, for a week. Sunlight kills it in a few hours. Its habitat outside the animal body is not known. It has never been found in dust, water, or sewer gas.

Path of entrance into the human body.—Is it by food or drink or by contaminated dust or by blood-sucking insects? Contact spread was tested by placing monkeys in more or less intimate contact. If the contact was quite intimate, infection occurred. If it was less intimate, so as to prevent contamination of the food by infected urine, infection did not take place. It may safely be concluded that the fever does not spread in man by contact. In support of this it may be stated that thousands of cases of Malta fever have been invalided home to England,

and treated in hospitals without a single case being reported of transmission to the orderlies, nurses, and other patients. The dust theory was tested by exposing monkeys to a dust-infected atmosphere. Several cases of infection occurred, but this was owing probably to the degree of concentration of the germs in the dust being great, far greater than ever occurred naturally. Similar experiments with dust sparsely contaminated proved negative. The mosquito theory was tested by means of numerous experiments with different species of mosquito found in Malta, and also with other blood-sucking insects. The results showed that this means of conveyance must be extremely rare. Feeding experiments, on the other hand, abundantly showed that the fever could be transmitted both by contaminated food and drink. Even a single drink containing few micrococci almost certainly causes the disease. All the surrounding animals were examined to find out if any of them were susceptible to the disease, and the fact that the goats in Malta act as a reservoir for the germ threw a flood of light on the whole question. Goats supply practically all the milk used in Malta. Suspicion did not rest upon them for a long time after the first inoculation tests in goats were made, but several months later more thorough investigation proved that 50 per cent. of the goats in Malta responded to the agglutination test, and 10 per cent. of them were actually secreting the germ in their milk. Monkeys fed on milk from an affected goat even for one day took the disease. The case of the S.S. *Joshua Nicholson* furnished the same proof for man. Sixty-five goats were shipped by this steamer for export to America. The milk was drunk in large quantities by the captain and the crew, and practically every one of those who drank the milk was struck down by Malta fever. Another proof is the coincident disappearance of the fever and the Maltese goat from Gibraltar, where they were both common prior to 1904.

Preventive measures.—Goats' milk has been banished from the dietary of most of the barracks and hospitals since the beginning of July 1906, and the incidence of Malta fever has dropped to one-tenth or less of its former number; and by an extension of the prohibition of the use of goats' milk it is hoped that Malta fever will entirely disappear from the soldiers and sailors stationed in the island.

THE SUPERSENSITATION OF PERSONS SUFFERING FROM DIPHTHERIA BY REPEATED INJECTIONS OF ANTITOXIN (HORSE SERUM).

J. R. CURRIE (*Journ. Hyg.*, Cambridge, 1907, January, vol. vii. No. 1) investigated 135 cases of diphtheria treated in the Belvidere Hospital, Glasgow, by repeated injections of antitoxin, to determine if any harmful results could be attributed to those injections comparable with those induced in guinea-pigs by similar treatment with the serum of animals of a different species, and generally spoken of as supersensitation. He found that while repeated injections of antitoxin did tend to produce supersensitation in man, the results were not serious, and lent no countenance to the suggestion that death might follow their use in persons suffering from diphtheria.

DERMATOLOGY.

UNDER THE CHARGE OF

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New Views on Seborrhœa.

Leslie Roberts (*Liverpool Med.-Chir. Journ.*, 1907, January), always an original thinker, states emphatically that, in his opinion, seborrhœa is neither a disease nor a secretion, but rests on the anatomical basis of the follicle. This is a recess in the skin, filled up by two formed products, hair and sebum. Both consist of cells with keratinised walls, in the one welded together to compose the firm structure known as hair, in the other massed into a plastic body of indefinite shape owing to the preponderance of fatty matter, or sebum. There is perfect anatomical continuity between the early and final stages in the metamorphosis of the living germinal cells into the fat ones. Exfoliation is one of the fundamental characteristics of the epidermis, and the three ultimate modes of its expression are — hair growth, steatidrosis or normal seborrhœa, and desquamation of the cuticle. These are so exquisitely balanced that no two can ascend without the remaining one descending. Thus, if the sebaceous gland hypertrophies, the sebum is increased in consequence, while the hair bulb diminishes and the hair is less. The converse is likewise true, increase in the hair is associated with atrophy of the sebaceous gland. At puberty in the male, excessive growth of the sebaceous glands on cheek or chin retards the development of hair in these regions. Seborrhœa of the scalp in adults is the forerunner of progressive baldness. Alopecia areata is only one of the many manifestations of seborrhœa. In well-marked acne the comedo is surrounded by a bald area. The pedigree of the sebaceous gland traced through the animal series suggests that these glands were intended by nature to defend the skin from injury and the invasion of parasites. Without the aid of the sebaceous matter the horny cuticle would be hygroscopic. It would be constantly absorbing moisture from the atmosphere and swelling up, with injurious consequences to the individual. If retained in the follicles, it tends to decompose under the influence of microbes. In their anatomical distribution on the surface of the body, the maximum is reached on either side of the middle line, and is thus correlated with the organs of generation and lactation. The curves which represent the average sexual life of the individual and those corresponding to the origin, rise, and decline of the sebaceous glands, pursue a parallel course in the child, the adult, and the aged respectively. He differs from Sabouraud, who regards seborrhœa as of microbic origin, but agrees with Jacquet, that even as exaggerated at puberty, it is still a pure physiological process. Its consequences are best studied in relation to the development of the individual. In infants on the scalp as greasy yellowish scales, and there the usual precursor of eczema. In the youth associated with greasiness of the face and the formation of comedones. Suppuration and acne he associates with the acne bacillus only so far as this organism may lead to its decomposition, probably brought about by retention and pressure, as all the fatty contents of the follicle contain it, whether comedic or not. Pustular acne is thus merely an accidental phase of seborrhœa. In the adult loss of hair is inevitable in seborrhœa, for in the dual struggle between the hair bulbs and the sebaceous glands, the latter are always victorious. In rosacea, also a sequence of seborrhœa, it is interesting to note that the region beneath the eyes, even in the worst cases, remains white and unaffected, since this is a non-seborrhœic region. He bears testimony to the efficacy of sulphur in the treatment of seborrhœa, and in rosacea in particular he says that it is incomparably superior to other remedies, and the reason for its apparent failure lies in lack of boldness to push it to its full extent.

Darier (*Ann. de dermat. et de syph.*, Paris, 1907, January) adopts a somewhat different view. Having observed the divergencies conspicuous in the writings of authors as to what seborrhœa is, and how various skin disorders are related to it, he presents a historical sketch of the subject. From this he concludes that several distinct manifestations have been confounded, and that subjacent to all is a particular unhealthy state of skin, which is identical in all the affections erroneously termed "seborrhœic." To this he attaches the name "kerosis," of which the root simply indicates an alteration of the horny epidermis, and the termination that the condition is a chronic one, and not necessarily inflammatory. He defines kerosis as a morbid state of the skin, characterised by a yellowish or greyish tint, with accentuation of the pilo-sebaceous orifices, of a consistence sometimes fatty, sometimes dry, with a tendency to branny desquamation and a special vulnerability, which predisposes to certain superficial infections. This alteration of the skin is regional, it occupies situations generally affected by seborrhœa. In proportion as the kerosic change predominates in the investing epidermis, in the pilo-sebaceous or the sudoriparous apparatus, does it betray itself by diversified phenomena, which may be classed as follows: (1) Branny desquamation, which may be arid or unctuous,—dry or fatty pityriasis; (2) increased secretion of the sebaceous glands, —seborrhœa; (3) modification of the pilary secretion, frequently exaggerated at the commencement, subsequently diminished,—hypertrichosis, alopecia, baldness; (4) exaggeration of the secretion of sweat, which may appear more oily than is usual,—hyperhidrosis, hyperhidrosis oleosa. To these direct consequences there may be added some indirect ones, such as peculiar folliculites, constituting types of acne,—acne vulgaris, necrotica, keloidea. Or surface infections, as the seborrhœic eczema of Unna, the steatoid pityriasis of Sabouraud. Returning to the cardinal symptoms of kerosis, besides the yellowish tint the kerosic skin is modified in its lustre, it may be dull and powdery, or oily and glistening. The cause of this alteration is obscure, but he believes that the corneous layer is both thicker and less translucent than in the normal condition, implying a qualification of keratinisation, combined with some superficial anæmia and slight œdema with reduced tonicity. As regards the accentuation of the pilo-sebaceous openings, there may be an orificial hyperkeratosis, or simple dilatation if complicated with seborrhœa. On the scalp, pityriasis capitis is the most frequent manifestation of kerosis. This begins by small, limited foci, which gradually extend, yet this does not necessarily prove its parasitic nature. The steatoid kind, however, is manifestly a micrococcic superaddition, an eczematous complication of kerosis. In the case of alopecia, commonly regarded as of seborrhœic origin, Darier holds that there is at first at least excessive production of hair, with successive and repeated precipitate moultings, till papillary fatigue sets in, with consequent atrophy. Kerosis may also be associated with hypertrichosis, an observation hitherto overlooked. As to its nature, it is a disturbance of nutrition of the skin, in which the circulation of its juices and its keratinisation undergo modification. It is extremely widespread, and in its attenuated forms impinges closely on the physiological, yet some individuals are quite free from its incidence. It is intimately connected with the vernix caseosa and the sebaceous acne of infants, and as these are non-microbic processes, he assumes that in its essence kerosis is so too, but no doubt micro-organisms find in it a congenial soil for germination, and may then provoke inflammatory phenomena.

Still another view of seborrhœa, and one of its consequences, is presented by Parker (*Med. Rec.*, N.Y., 1907, February 9) under the heading, "The Causes of Common Baldness." By this he means hair shedding occurring independently of any other disease and limited to the top of the head. In 1901 he published a paper in the same journal, enunciating that the fundamental cause was a form of respiration which leaves residual air undisturbed in the air cavities of a portion of the lungs, due to the absence of upper chest breathing. He explains this effect because whenever residual air is kept chambered in presence of warmth and moisture, it invariably undergoes a change and develops a soluble poison that is capable, when present in the blood, of exerting a disturbing influence upon hair growth. Why this should limit its destructive action to the hair of the vertex, he explains from the circumstance of the roots of the hair there lying over the hard and practically bloodless aponeurosis, being deprived of the nourishment supplied to those over softer muscular tissue as on the other parts of the head and face. Observations over a series of years had convinced him that those affected with common baldness do not employ upper chest breathing, while those who escape, do. Those who in consequence of advice practised continuously upper chest breathing, not only in course of a short time became free from dandruff (present in about 80 per cent. of these cases), but the hair, from being dry and harsh, or sometimes unusually oily, assumed a natural appearance. Some weeks later new hair showed itself, first at the margins, and thence slowly advanced over the bald parts by extension. Any interruption of treatment by deep inspirations was followed by a corresponding check to the progress of the cure. To test this on animals, sterilised distilled water was charged with expired air, and then kept at body temperature for ten days. This water was injected beneath the skin of fowls and dogs daily for five months. At the expiration of that time the birds had lost their feathers, and in the dogs portions of the body became denuded of hair. In six weeks after discontinuance, the feathers and hair had regrown. Control experiments with simple distilled water or charged with atmospheric air produced no such results. He has got from the water impregnated with expired air a substance which he calls trichotoxin, not a ptomaine, and producing no effect when swallowed. He admits freely that the proof of his theory cannot be regarded as complete.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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AMAUROTIC FAMILY IDIOCY.

IN *Brain*, London, 1906, June, two cases of amaurotic family idiocy are reported, and certain important conclusions as to the nature and origin of the disease are advanced, of which we present here a brief résumé. The characteristic changes in the nerve cells and the relatively little affection of the fibres are so dissimilar to the morbid anatomy of any other condition that it is a natural assumption, altogether apart from any consideration of its clinical symptomatology, to regard amaurotic family idiocy as a disease *sui generis*. There is strong evidence that it is a primary disease of the nervous elements. These are affected not only throughout the whole nervous system, but also in the dorsal root ganglia, and in the retina, and so universally that not a single normal cell can be found. All the evidence forthcoming proves that the disease is not due to a primary affection of the neuroglia, but that the proliferation of the latter has only followed the degeneration of the nervous elements. Further, there is no evidence to suggest that the changes in the nervous elements resulted from any vascular condition. There was no visible disease of the vessels, and no signs of either old or recent inflammation. Again, it can be asserted that the nerve cells are relatively more affected than the nerve fibres. In many parts, as in the cerebellar tracts, in the dorsal spinal roots, and in the optic system, there may be no visible change in the fibres, though the cells from which they spring may be visibly altered. From this fact it may be concluded that the affection is a primary cell disease, and that the alterations visible in the nerve fibres are only secondary to this. The condition of the nerve cells shows that the interfibrillar protoplasm is very much more severely affected than are the neuro-fibrils, and suggests that the primary change is disease of the interfibrillar protoplasm, and that to this the alterations in the neuro-fibrils are secondary. The following conclusions on the etiology of the disease from its morbid anatomy are also arrived at, in conjunction with its clinical symptomatology. (1) It is not due to arrested development, otherwise the clinical symptoms would probably be evident from birth, which has not been so in any of the cases observed, and there is no reason why if this were the case a mere arrest of development should produce an invariably fatal and progressive disease. There is also little evidence of maldevelopment, and the appearances can be explained by the wasting which the convolutions must undergo as a result of the disease. (2) The negative results of the bacteriological examination of one of the reported cases, and the entire absence of such reactions in the vascular and lymphatic systems which so frequently accompany bacterial infection, suggest that the disease is not due to bacterial toxins. The clinical facts also argue against this theory; its family nature, its occurrence only in the Jewish race, and its constant appearance within a certain short period of life, all militate against this view. (3) The final conclusion possible, and which is supported by the microscopical investigation, is that the disease is due to some biochemical property of the protoplasm of the cells, as a result of which it undergoes certain changes which result in its degeneration, and consecutively in degeneration of the parts of the neurone (neurofibrils, axis cylinders, and myelin sheaths), the normal existence of which is dependent upon it. The cell changes have not the character of a simple atrophy; in fact, they seem to be due to an excessive growth of the protoplasm which later undergoes degenerative changes.

CONGENITAL RICKETS.

THE following is a brief abstract of a paper by Marfau on congenital rickets (*Am. Journ. Med. Sc.*, Phila., 1907, February). (1) There is a congenital rickets latent at birth or only to be detected by microscopical examination. In these cases the bony deformities are not appreciable until some time after birth. Whether this form can be distinguished from an early acquired rachitis by any definite sign is not known, but when a rachitis begins very early with craniotabes, and when the softening of the cranial bones is clearly appreciable before the fifth or sixth week, it seems probable that the disease began before birth. (2) A certain number of infants affected with congenital rickets are born dead or non-viable. It is among these that cases of excessive deformity are found, and they are often accompanied by visceral malformations. Two forms which specially interest the physician are those in which congenital rachitis evident at birth is compatible with life, and continues to develop after birth, and in which the evolution demonstrates the nature of the osseous alterations observed at birth. Typical examples of these forms are reported by Marfau. (3) In the one representing the rarest conditions the skeletal deformities are from birth so characteristic, that, though slight, one cannot mistake their nature: enlarged cranium with prominent forehead and jutting bosses, enlarged fontanelles, separated sutures, distinct costal nodosities, enlarged epiphyses and curved diaphyses. If the child is carefully guarded, and escapes serious infection, the deformities show little increase, becoming slightly accelerated after birth, then remaining quiescent for a long time, and finally disappearing toward the end of the second year. In the second form of the disease there is at birth craniotabes either alone or associated with a slight costal rosary. Differing from the preceding, the rickets here progresses after birth as if at the time of parturition it was in the first stage. Later on, one sees characteristic deformities of the cranium, thorax, and limbs develop. At the same time as in the preceding case, if the child is well cared for and escapes infection, the rickets remains quite slight in degree and disappears without leaving decided deformity. As common characteristics of these two forms Marfau states that such children are born frequently before term, are below normal weight at birth, and present in the course of the first two years of life an anæmia more or less profound.

HEREDITARY SYPHILIS AND SYPHILITIC HEREDITY.

IN *Am. Journ. Obst.*, N.Y., 1906, November, p. 748, there appears under the above heading an interesting résumé of a paper by Gaston, drawing a distinction between these two conditions. Both conditions are often fatal to the descendants, but they act in different ways. Hereditary syphilis produces syphilitic lesions that often kill the infant or prevent its birth alive. Syphilitic heredity is like any bad heredity, and results in degeneration such as occurs in tuberculosis or other diseases in the parents. The rôles of the father and mother are about the same as to the production of the malady in the infant and its mortality. Mercurial treatment sterilises syphilis and prevents its transmission to the descendants, so that for the sake of the children, whether the syphilis is of new or old standing, the parents should always be subjected to treatment. Hereditary syphilis shows direct transmission, while syphilitic heredity results in a failure of the normal evolution of the product of conception, and produces organic or functional troubles of nutrition or development not having a specific character. Morbid heredity depends directly upon the condition of the mother at the time of conception. After conception the father cannot transmit anything to the child except through the mother, and there is no direct transmission but only a modification of the nutrition of the embryo in the womb. Such is no longer contagion but congenital morbid heredity. Mortality of the child is one of the most important indications of parental syphilis; half the pregnancies result in abortion, premature labour, or death soon after birth. Syphilis, paternal, maternal, or conjugal, is equally fatal to the child, but in different ways at different periods of the disease. Paternal syphilis at whatever stage and of whatever virulence gives mortality in the first generation, but it diminishes with the age of infection and lessened virulence, and is rare when the syphilis is of the nervous system. Maternal syphilis with a healthy father is grave for the child; all children are affected in some way. When it is ante-conceptional, no healthy child is born if treatment is neglected. Syphilis of the father produces abortions; that of the mother produces dead-born children and those that die soon after birth. Conjugal syphilis is less destructive than maternal, more so than paternal. Syphilis of the second generation is more difficult to study. There is not a perfect immunity transmitted by the parents. Syphilitic heredity has no special characteristic that will separate it from other forms of degeneracy. Hereditary syphilis may be prevented by preventing marriage, unless the parents have been thoroughly treated and just before the marriage. A syphilitic of three or four years' standing may hope to have a normal family if he has been subjected to proper and regular treatment.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*June* 6, 1907.—Dr. J. O. **Affleck**, President, in the chair.—Dr. **Philip** showed specimens from three cases of hydrochloric acid poisoning.—Mr. **William Guy** read a paper entitled "The Administration of Gas and Ethyl Chloride," which appears in our present number.—Mr. C. W. **Cathcart** read a paper on "The Use of Massage and Movement in the Treatment of Fractures."—Drs. J. S. **Fraser** and **Comrie** read a paper on "The Naso-Pharynx as Infection Carrier in Epidemic Cerebro-Spinal Meningitis." Epidemics are frequent in seaport towns and in collieries, probably because the darkness, moisture, and warmth found in ships' holds and in collieries favour the growth of the organism. Children of miners come into contact in school and at play, and so become infected. The organisms are found in naso-pharynx of the miners, and the secretion from them communicated by kissing and other means conveys the contagion to children. Coal mines play the same part in spreading cerebro-spinal meningitis that schools do in other infectious diseases. The methods used in investigating cases and "contacts" and of identifying the organisms were then described, and in conclusion it was urged that the nose and naso-pharynx being the site of lodgment of the organisms should be disinfected with formalin or other antiseptic, and that "contacts" should be kept in quarantine till declared free from organisms.

Edinburgh Obstetrical Society.—*June* 12, 1907.—Dr. J. W. **Ballantyne**, President, in the chair.—Dr. **Brewis** read a paper on "Six Cases of Vaginal Cæsarean Section." The indications for the operation varied, and included eclampsia, pernicious vomiting of pregnancy, heart disease, and placenta prævia. Dr. Brewis described the technique of the operation, and pointed out how simple it was, requiring very few instruments and no extra assistance. He advised the operation in all cases where rapid delivery was essential, and preferred this method to dilatation of the os uteri, especially when it was rigid. All the six mothers recovered, and, in the cases where the child was at or near full time, it also survived.—Dr. B. P. **Watson** read "A Case of Repeated Abortion due to Syphilis, treated by Potassium Iodide; birth of a Child with Congenital Goitre." The patient, æt. 27, had a definite history of syphilitic infection, followed by five abortions—first, at seventh month; second, at third month; third, at seventh month; fourth, at three and a half months; and fifth, at seventh month. In the following pregnancy she was treated with potassium iodide throughout, and gave birth to a full-time living child. During the next pregnancy the potassium iodide was accidentally discontinued for a fortnight at the eighth month; the child died *in utero*, and was born a fortnight later. In her last pregnancy the patient had potassium iodide throughout, and gave birth to a full-time living child. This child had a large goitre; and, in conclusion, Dr. Watson discussed the possible significance of this. He reminded the Society of the suggested relationship between the administration of chlorate of potash during pregnancy and congenital goitre. He pointed out the difficulty of proving this, and threw out the suggestion that if there was anything in the theory, and if his case were due to the drug, it might be due to the potash, and that any salt of potash would have the same effect.

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EDITORIAL.

The late Sir William Tennant Gairdner, K.C.B.

THE links binding us to the great men who rendered the second half of last century so illustrious, are breaking one after another, and every new loss enhances the feeling of sorrow that we shall see their faces no more. We have to attempt in some measure to express our sense of mournful regret on the death of Sir William Gairdner, in whom the medical profession has lost one of its most distinguished ornaments. For many years he has been universally regarded with loving reverence as the type of all that is highest and noblest in the physician. Although he has, on account of the state of his health, been compelled to live in comparative retirement almost ever since his resignation of the Glasgow Chair, he nevertheless to the last day of his life continued to exert wide influence over the minds of his younger colleagues, and to the end nothing gratified him more than to be taken into their confidence upon any matter. As is generally known, Sir William was seized about six years ago by an attack of what is now termed the Adam-Stokes syndrome. The first and most serious attack was followed by several others at short intervals, and a condition of persistent bradycardia developed, which remained permanently. The end was characteristic of the man in its peaceful serenity. On the 28th of June he had received a visit at his house in Colinton from Dr. Yellowlees of Glasgow; he accompanied him to the door, and then lay down to read. In about an hour he was found to have passed quietly away. During his illness he took the keenest interest in all the symptoms of his own case, which he discussed with many of the leading physicians both at home and abroad.

The main facts of his life are widely known, and only a brief summary need be given. A son of the learned Dr. John Gairdner, President and Historian of the Edinburgh College of Surgeons, grandson of Captain Gairdner of the Bengal Artillery, and great-grandson, through his mother, of the Rev. Dr. Dalrymple of Ayr, William Tennant Gairdner sprang from intellectual families on both sides. It may be interesting to add that the late Sir Douglas Maclagan was also a descendant of Dr. Dalrymple, and that he used to relate how Robert Burns had been baptized by the reverend gentleman in the early part of his clerical career, while he went through the same ceremony at his hands towards the end of his ministry. Born on the 8th November 1824, Gairdner studied medicine in Edinburgh, where he was a favourite pupil of Alison and Christison, and obtained his degree in 1845. Immediately after graduation he spent a winter in Rome as the medical attendant of Lord and Lady Beverley. He was, thereafter, for two years a member of the resident staff of the Royal Infirmary, and then settled down to practise as a physician in his native city. In 1848 he became Pathologist to the Infirmary; in 1853 he was appointed Physician, and in the same year he began to lecture on Practice of Medicine. In 1862 he was transferred to the Chair of Medicine in Glasgow, and added another to the galaxy of brilliant men, who, during the "Sixties" and "Seventies," made the western University famous. He held the Chair till 1900, and during his tenure of the office he was successively Physician to the Royal Infirmary and to the Western Infirmary of Glasgow. Shortly after his appointment to the University he became Medical Officer of Health for the city of Glasgow, and his field of activity was therefore a very extensive one. During all these years, moreover, he was widely in request as a consulting physician throughout the whole of Scotland and the north of England.

As a teacher of medicine, Sir William Gairdner was one of the most interesting and stimulating instructors of this or indeed of any age. Endowed with a mind capable of grasping the most intricate subject, and able to reduce to perfect order what seemed to most men a mere chaos of detail, possessing also the faculty of peering into the most hidden causes of external phenomena, it is little wonder that he was able to teach the diagnosis of disease with singular thoroughness. From his wide general culture, and from his special knowledge of many little known corners of literature, he was always able to illuminate any subject with which he might be concerned, so that to the thoughtful student of medicine his teaching was wonderfully attractive.

During the crowded years of his full activity as a teacher, Sir William Gairdner was able to contribute very largely to the literature of the profession. A considerable number of his earlier papers and articles appeared in this Journal, or, to be more exact, in the *Monthly Journal of Medical Science*, which was incorporated with *The Edinburgh Medical and Surgical Journal* in 1855 to form *The Edinburgh Medical Journal*. Sir William was editor of *The Monthly Journal* from 1848 until 1852, and during this period, indeed till the date of the amalgamation of the Journals, he contributed a large series of important contributions on pulmonary, circulatory, renal, cerebral, and hepatic diseases; thereafter he frequently adorned the pages of *The Edinburgh Medical Journal* with important observations. There was scarcely a department of medicine to which he did not add something new either in regard to pathological changes or clinical features. His most valuable contributions to medicine were undoubtedly in the domain of the circulation. The relations existing between the heart and vessels, on the one hand, and the different organs of the body, on the other, occupied much of his attention. He was certainly the earliest observer to devote attention to the intimate connection between coronary supply and myocardial conditions. He brought into prominence the reciprocal influence of the lungs and the heart. His study of hypertrophy and dilatation will remain for all time a monument of careful observation and philosophic deduction. In the clinical observation of circulatory diseases, Sir William Gairdner placed us under a still deeper debt of gratitude. It can never be forgotten that it was he who introduced the system of representing the sounds and murmurs of the heart by means of diagrams, whereby he was able to render the clinical facts easy of apprehension. With Stokes, Balfour, and Fagge, he must be regarded as one of a tetrad who made the diagnosis of mitral obstruction a matter of absolute certainty, and therefore, like the other three, as a worthy follower of Fauvel. He was the earliest to place the recognition of tricuspid obstruction upon a sure basis, and the remarkable case which he originally described in "Clinical Medicine," and afterwards in the *Edinburgh Hospital Reports*, was the first instance of the disease diagnosed during life and verified after death. His investigations into the clinical features of aneurysm were of the greatest value. It is perfectly true that Reid observed the inequality of the pupils in mediastinal tumour, and that Walshe observed the symptom in thoracic aneurysm. Neither of these authors, however, made any attempt to explain the appearance, and it was left to Sir William Gairdner to add observations of much value regarding the phenomenon, and to give an explanation of its significance. He further described the alterations in the colour and moisture of the skin brought about in aneurysm by interference with the sympathetic nerve. The article on angina pectoris in Reynolds' "System of Medicine" will always remain one of the greatest medical classics of our country. For beauty of diction and wealth of illustration, it has no equal in our language upon the subject with which it deals, —even the lectures of the eloquent Latham, exquisite though they are, fall short of it. His last contribution to circulatory disease was the valuable article on aneurysm in Allbutt's "System of Medicine," in which his ripe experience is luminously recorded.

His "Contributions to the Pathology of the Kidney," published in 1848, was notable for the early description of waxy disease and the "Pathological Anatomy of Bronchitis and the Diseases of the Lung, connected with Bronchial Obstruction," was marked by the originality of its views. His interesting volume, "Clinical Medicine," published on the eve of his departure from

Edinburgh for Glasgow, was stamped with the impress of originality, and his important work on "Public Health," published in the same year, contained the most valuable opinions on Hygiene. In later years he produced "Insanity: Modern Views as to its Nature and Treatment," "Tabes Mesenterica," "The Physician as Naturalist," and after his retirement "The Three Things that Endure." It is vouchsafed to very few men to have left, in the midst of a life crowded with multifarious and arduous duties, such a magnificent record of literary achievement.

Distinctions came to, but were not sought by him. Honorary degrees from his Alma Mater and the sister University of Dublin, the Fellowship of the Royal Society, the position of Physician to Queen Victoria, and afterwards to King Edward; the distinction of Knight Commander of the Order of the Bath; the Chair of the Edinburgh College of Physicians, which had never been previously filled by any one who did not reside in the city; and the Honorary Fellowship of the Irish College of Physicians. These honours were borne by him with calm dignity; some of them he valued highly, to others he was indifferent; he did not consider that University men should hide their academic distinctions by the titular honours conferred by Court favour; yet, as showing how careful he was not to ruffle the susceptibilities of any one, it may be added that, when referring to the fact of his having declined the honour of knighthood, he said his whole care was to do so in such a way as not to seem to cast any reflection on those who had accepted it.

Sir William Gairdner's great characteristics throughout life were transparent honesty, unswerving truthfulness, and indomitable courage, and these high qualities were combined with a courtesy absolutely unfailing, a forbearance ever considerate, and a gentleness often tender. Magnanimity of mind and generosity of thought rendered him chivalrous in the highest degree, and made him perfectly unsuspicious of guile. The great features of his character even to the end of his life were youthfulness, buoyancy, and optimism. During one of our last interviews the words of one of his old friends occurred to the writer of this sketch:

> "Call him not old, whose visionary brain
> Holds o'er the past its undivided reign:
> For him in vain the envious seasons roll
> Who bears eternal summer in his soul."

No one could thoroughly appreciate the beautiful mingling of a rich philosophic mind and a simple childlike nature, unless he had been privileged to be an inmate of Sir William's household, and to observe the perfect trust and loyalty which held sway in the family. Into this sacred region it were unbecoming to enter. In conclusion, it need only be added that Lady Gairdner and her sons and daughters have the sincere sympathy of a wide circle of those who loved and revered him whom they mutually mourn.

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should bear in mind that, by being enabled to concentrate their attention on the various branches of the curriculum in the manner indicated, they come under an obligation to attain a more accurate and thorough knowledge than has sufficed in the past to secure success.

Other changes, such as the devotion of the second year of study wholly to physiology and anatomy, and the transposition of pathology to the place in the curriculum previously occupied by materia medica, will, we believe, prove important and wise reforms, although the fact that a student may pass in physiology before completing his course of anatomy has been subjected to adverse criticism. On the whole, it must, however, be admitted that the Edinburgh Ordinance is a serious attempt to grapple with a difficult problem in the medical curriculum of the Scottish Universities, and we believe that it will prove successful, and tend to the efficiency both of the teaching and of the graduates of this University.

The Graduation Ceremony.

AT the recent graduation ceremonial the honorary degree of LL.D. was conferred upon Dr. Bayard of St. John, New Brunswick, who received the degree of Doctor of Medicine of Edinburgh University in the year 1837. Dr. Bayard, now 93 years of age, is still engaged in practice in St. John, and to mark the seventieth anniversary of his graduation his friends have arranged a celebration in his honour upon the 1st of August. Dr. Bayard is, so far as is known, the successor to the late Dr. Alexander Peddie as Nestor of Edinburgh Medical Graduates, and in addition to conferring the above honour the Faculty of Medicine have forwarded an address bearing testimony to their appreciation of the event and of Dr. Bayard's unique position.

The degree of Doctor of Medicine was conferred upon seventy graduates, and of these six were awarded gold medals for their theses, and seven received "high commendation." The theses which received the distinction of a gold medal were those of Dr. Hesketh Biggs, J. A. Gunn, James Lochhead, Stuart M'Donald, H. A. Stewart, and Henry Wade. The graduates for the degree of M.B. Ch.B. numbered 119, and the coveted Ettles Scholarship was awarded to R. H. Jamieson, who also obtained the Freeland Barbour Fellowship.

The Promotor, Sir Halliday Croom, afterwards addressed the graduates, taking as his subject the responsibilities which the graduates owe to the University, to the profession, and to their patients. He thought that the secret of happiness in their work was to be found in an "enthusiasm of humanity."

ORIGIGINAL COMMUNICATIONS.

ON ABDOMINAL PAIN, AND ESPECIALLY ON PAIN IN CONNECTION WITH "ILEUS."[1]

By K. G. LENNANDER (*Upsala*), M.D., LL.D., Hon. F.R.C.S. Eng. and Ed.

FROM my published works it may be gathered that I have not been able to find any abdominal organ provided with the sense of pain which is innervated only by the vagus or the sympathetic nerves. Sensations of pain within the abdominal cavity are, according to my experience, transmitted only by the phrenic nerve, the lower six intercostal, the lumbar, and the sacral nerves.

My former pupil, M. Ramström, Professor of Anatomy at Upsala, has given us the first exact description of the course of these nerves within the diaphragm and the peritoneal lining of the anterior abdominal wall. He has shown that the older descriptions of the distribution of these nerves are incorrect. For instance, he has not seen any branches of the phrenic nerve running down from the diaphragm to the anterior abdominal wall, nor has he been able to trace a single branch of the phrenic nerve through the suspensory ligament on to the capsule of the liver. In the same way, he has been unable to find any twigs from the intercostal nerves on the diaphragm continuing on to the capsule of the liver. These observations of Ramström agree with my own experience with regard to the sensitiveness of the liver. Even a strong faradic or galvanic current applied to the surface of the liver above the gall bladder does not excite pain. I have in some cases, where the liver was lying low down, cut through the under surface of the gall bladder as far as the cystic duct without causing any pain, whereas the patient complained as soon as I tilted the liver or dragged upon the common bile duct, thus putting the cerebro-spinal nerves of the abdominal wall on the stretch.

The stomach and intestines, the liver, and gall bladder are not only without the sense of pain, as mentioned, but also without the other three varieties of sensibility—the senses of pressure, of cold, and of heat.

We have often been able to ascertain that diseased bowels are quite as insensitive to operative measures and to electric stimuli as are healthy ones. Thus the old theory of Flourens has been disproved.

After many investigations—some of which have been attended by the well-known physiologist, Hj. Öhrvall, and several by

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[1] One of the introductory papers to the American Medical Association Congress, June 1907, "Discussion of Ileus."

Professor Ramström, as recorder—we have come to the conclusion that the parietal peritoneum of the anterior abdominal wall only possesses the sense of pain, and is devoid of the senses of pressure, cold, and heat. We chiefly examined the peritoneum behind the recti muscles, from a point 4 to 5 cms. above the umbilicus to a point midway between the umbilicus and the symphysis pubis. Our view speaks decidedly in favour of the specificity of the nerves of pain, and to prove that the whole of the parietal peritoneum is provided only with nerves of pain, a condition previously only known as regards the cornea.

It is my belief that all painful sensations within the abdominal cavity are transmitted only by means of the parietal peritoneum and its subserous layer, both of which are richly supplied with cerebro-spinal nerves around the whole of the abdominal cavity, possibly with the exception of a small area in front of the vertebral column below the crura of the diaphragm between the two chains of sympathetic nerves. Here no cerebro-spinal nerves have as yet, as far as I know, been found; and I have on a few occasions observed that within this area the patient did not respond to hard pressure with the finger or with an instrument, nor did he feel when a small portion of the mesentery of the small intestine was put upon the stretch.

During operations one has opportunities of noticing that what causes pain is especially the stretching of the parietal peritoneum, as well as the stretching of the parietal attachments of the mesenteries, as, for instance, the laying in or removal of gauze compresses between the viscera and the parietal peritoneum, the dragging forwards of the cæcum, of the vermiform appendix, or of any other organ as soon as a stretch is being put on its mesentery, *i.e.* upon its normal attachment to the abdominal wall, or upon adhesions which may connect it with the abdominal wall. Should, on the other hand, a compress lie between the viscera without coming into contact with the abdominal wall, the patient does not feel when it is removed. In the same way, he does not feel when adhesions not connected with the abdominal wall are being stretched or broken down. As far as I can judge from my observations, the parietal peritoneum along the thoracic aperture and around the foramen of Winslow is especially sensitive to stretching, displacement, etc.—probably more sensitive than other parts. A slow and gradual stretching of all the layers of the abdominal wall by ascites or meteorism is hardly painful. Still, a high degree of meteorism is a condition which, to put it mildly, is attended by great discomfort. If, in a severe case of paresis of the bowel, one succeeds in emptying the intestine by means of typhlic, jejunal, or gastric fistula, the procedure is promptly followed by such evident relief that every one will become convinced of the great distress of the previous condition. That a maximal degree of meteorism which quickly comes on is an extremely painful condition, which rapidly may bring on danger to life, I have myself witnessed. A young student had at the same time a volvulus of the ileum and an acute dilatation of the stomach; four hours and a quarter after the appearance of the first symptoms he was pulseless, and only groaned, "Operate quick; I'm bursting."[1]

Infective processes in the abdominal viscera, such as ulcers and acute inflammations, are attended by lymphangitis and lymphadenitis of the mesenteries. The infection spreads along the lymph vessels to the subserous tissue of the abdominal wall, and the lymph vessels following the course of the arteries, the lymphangitis very soon reaches the sides of the aorta, along which it then may continue quite up to the thoracic cavity. *A lymphangitis of the parietal subserous connective tissue increases very much the sensitiveness of the cerebro-spinal nerves to any condition liable to cause pain.* All we know about lymphangitis and lymphadenitis attending infections of the mouth, of the pharynx, of the extremities, and so on, we can apply to the same processes within the abdominal cavity. We know that the severity of pain attending a lymphangitis and lymphadenitis of the above-named regions varies according to different infections. The same is applicable to the abdominal cavity.

The irritability of the nerves of pain of the parietal peritoneum is much increased even through a slight acute peritonitis. In the case of a serous peritonitis or peritoneal irritation, the boundaries of the hyperæmic zone of the serous membrane of the anterior abdominal wall can be marked out on the abdomen almost to the centimetre, by gentle palpation with one or two fingers. With further increase of the hyperæmia and of the inflammation, the sensitiveness is at first almost proportionally increased.

The fact that so many infective processes within the abdomianl cavity begin with pain "in the middle of the abdomen," is most likely due to (1) an increased sensitiveness of a large portion of the parietal peritoneum on account of the lymphangitis or peritonitis; (2) a considerably increased, and most likely often irregular, peristalsis at the commencement of these illnesses, which, besides pain, often causes a feeling of sickness, vomiting, and one or more actions of the bowels. On account of the increased sensitiveness, the movements of the stomach and intestines against the parietal peritoneum, and the stretching of their respective mesenteries, are felt as severe pain. In most cases, however, the general peritoneal irritation soon passes off. Only the part more especially infected remains in a condition of inflammation, and the abdominal pain will become localised to this spot. In those cases where the infection spreads over a large portion of the peritoneal cavity, thus giving rise to a more or less generalised peritonitis, the pain will diminish as soon as the bowel becomes paretic, and the nerve-endings of the parietal peritoneum have been more or less destroyed by the severe inflammation.

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[1] Lennander, *Deutsche Ztschr. f. Chir.*, Leipzig, 1906, Bd. lxxxv. p. 151, "Recovery after laparotomy, reposition of the ileum, jejunostomy, gastrostomy, and, later on, gastro-jejunostomy."

Pain in connection with perforation.—When a viscus, such as the stomach or the bowel perforates, or an abscess bursts into the peritoneal cavity, the first pain is caused by the contents of the organ or of the abscess coming into contact with the parietal peritoneum. The severity and character of the pain depend upon the nature and quantity of the escaping fluid, to what extent it immediately comes into contact with the parietal peritoneum, and lastly, upon the intensity of the contractions of the stomach and bowels brought on by the irritation of the peritoneum.

A good many facts are easier to understand if one bears in mind that only the parietal peritoneum can transmit painful sensations. The first pain following a perforation of the duodenum may be located to the right iliac fossa. The paroxysmal pains in connection with a gastric ulcer are elicited by the movements of the stomach, that is to say, by its dragging upon a parietal serous membrane which is hyperæsthetic on account of the lymphangitis from an infected ulcer. If, by the aid of a jejunostomy, the stomach is put at rest, the pains disappear. Supposing a patient with an inflammatory focus lying in the middle of the small intestines, these being covered by a thick omentum, pressure on the abdomen will disclose no tenderness, whereas palpation per rectum may cause pain.

The hypotheses of Nothnagel as regards colic.—In human beings the subject of intestinal fistulæ, and to whom no anodyne has been given, the sensation of pain cannot be evoked by means of chemical, thermic, mechanical, or electrical stimului applied to the portion of the gut lying outside the abdominal cavity, so long as the stimulus or the contraction which it causes only affects the bowel. When, on the other hand, the contracting bowel drags on adhesions connecting it with the abdominal wall, pain is at once produced. Both theories of Northnagel are thereby disproved. The colicky pain cannot be due to pressure on the nerves of the bowel, owing to a tonic spasm of its muscular coat, when the intestinal wall can be simply crushed with a strong pair of forceps without the patient feeling anything. The pain can no more be due to anæmia of the intestine, on account of the spasm of its muscular coat, than to pressure upon the nerves of the bowel, because it is possible, by means of electrical stimulus, to bring on such a powerful contraction of the bowel that it feels as hard as a tumour and becomes a yellowish-white colour without the patient having any sensation of being touched.

Wilms, in an article,[1] and later on in his splendid work,[2] tried to show that all pains which are included under the term

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[1] *München. med. Wchnschr.*, 1904.

[2] "Ileus," 1906.

"colic" of the bowels are entirely due to stretching of its mesenteric attachments. Already, in my first publication of 1901, I had made the statement that every distension or contraction of a segment of bowel which is attended with traction upon its attachments to the abdominal wall, is bound to be painful, as it involves a stretching of the terminal nerve twigs of the parietal serous and subserous layers. With regard to the duodenum, together with the duodeno-jejunal flexure, the three flexures of the large intestine and the most distal part of the ileum, it goes without saying that these portions of the bowel cannot contract upon their contents in front of an obstruction without giving rise to a powerful dragging upon the mesentery, and, at the same time, a painful stretching of the sensory nerves of the parietal serosa. In the same way powerful contractions of the bowels are bound to involve a painful stretching of the parietal serous membrane in cases where the intestine has become fixed by adhesions to the abdominal wall, there existing at the same time an intestinal obstruction at this point. The pains in connection with "ileus," due to kinking, volvulus, etc., are thus easy to understand. On the other hand, could, according to my opinion, the stretching of a high and free mesentery of the small intestine, or of the transverse colon, not account for the pain attending a stricture of these parts of the bowel, when the stricture has not become adherent to the abdominal wall or in some other way fixed, because I could not think that a contraction of the bowel around its contents in front of the stricture could drag upon the parietal serosa and subserosa by that high and free mesentery.

Wilms accounts for the pain in these cases as being the result only of the stretching of the mesentery proximal to the stricture. He considers that a bowel when contracting upon its contents at the proximal side of a constriction, endeavours to assume a straight-line form in the same way as does the gut in sausage-making. The mesentery prevents the bowel from assuming the shape of a straight cylinder. The result is a stretching of the mesentery, and this is what causes the pain. In connection with this I made last year an experiment in a case where I had to resect more than one metre of the ileum, together with the cæcum and a large piece of the colon, this portion of the intestine having been some months previously excluded by means of an ileo-colostomy on account of multiple fistulæ and adhesions which could not be loosened. Under local and a short ether anæsthesia, the excluded portion of bowel was completely freed from all adhesions, only the normal mesenteric attachment being left; the patient being awake, a piece of the ileum, about 40 cms. long, was clamped and inflated with air. The bowel straightened, the mesentery got stiff, and assumed a fan-shaped form. It was standing out from the vertebral column, and the patient complained of pain, which passed off as soon as the bowel was emptied of air, thus allowing the mesentery to resume its normal position. The experiment was repeated with a considerably shorter piece of bowel. The result was the same. The mesentery became tight and stood out from the vertebral column, at which the patient suffered pain, Lastly, a piece of the intestine, only 5 to 6 cms. long, was shut off; although it was inflated to the extent of causing rupture of the serous membrane and the bowel to sink 1 cm. in between the two layers of the mesentery, the patient felt nothing. As soon, however, as the mesentery was being stretched for a few moments with the fingers, pain was felt. These observations are in full accordance with the above-mentioned view of Wilms as regards the stretching of the mesentery and the contraction of the bowel, and which I believe to be correct.

The pain in connection with a volvulus of the intestine or of an ovarian cyst naturally increases in proportion as the twisting comes on quickly and more parietal peritoneum is drawn into the pedicle.

Pain caused by displacement of the serous membrane of the anterior abdominal wall.—Many a time have I, when doing a laparotomy, passed into the abdominal cavity a finger covered with a thin, smooth indiarubber glove dipped into saline solution, and exerted a slight pressure on the anterior abdominal wall. Of this the patient has no perception, but as soon as the serous membrane is displaced against the muscles or aponeuroses of the abdominal wall, the patient has a feeling sometimes of touch, more often of pain, according to lesser or greater sensitiveness of the individual, and according to the degree of pressure and displacement employed. When asking the patient, "Have you ever felt anything like this ?" I have mostly received answers like these : "It feels like colic"; "it feels as if the bowel is being expanded by wind"; "it's like bad griping pains"; "it is worse than gripes." Answers like these I have, as mentioned, received when displacing a small limited area of the serous membrane at nearly any point of the anterior abdominal wall. On account of these observations, I believe that a displacement of the serous lining takes place and gives rise to pain as soon as a loop of intestine contracts on its contents, hardens, rises and presses against the parietal peritoneum. According to my opinion, these pains occur not only in connection with "ileus" but also in connection with temporary irregularities of the peristaltic movement of the bowels in people not suffering from abdominal disease. I have myself felt these griping pains, and I have been strongly inclined to localise the same to the anterior abdominal wall, most often to the left lower quadrant; as a rule, I have attributed them to the contraction of the sigmoid flexure. Here I may mention an illustrative case of displacement of the serous membrane of the anterior abdominal wall at the thoracic aperture through a subserous myoma of the fundus uteri, of about the size of a Tangerine orange, in a woman of eight to ten months' pregnancy. She had suddenly been taken ill with severe pains, vomiting, and inability to pass flatus. The medical attendant diagnosed a twisted ovarian cyst. As soon as the myoma had been removed under local anæsthesia, all symptoms disappeared. The ovaries were normal, and the pregnancy went on. I know also of another patient with a small subserous myoma of the uterus, who in the seventh month of pregnancy got pains aggravated by any movement. They were felt as a very painful friction, and went away as soon as the tumour was removed.

I have consequently come to the conclusion that "gripes" are due partly to a stretching of the parietal attachments of the bowel, *i.e.* the mesenteries, partly to a displacement of the serous lining of the abdominal wall.

If the bowel wall on the proximal side of a stricture obstruction is considerably thickened and the serous coat rough, the peristalsis is naturally attended by a much more extensive displacement of the parietal peritoneum than in the case of a normal intestinal wall. Contrary to Wilms, I consider this factor also to be a cause of the colicky pain attending intestinal obstruction.

Reflex rigidity of the abdominal muscles.—The abdominal muscles respond to an acute sensation of pain originating from the parietal peritoneum and subserous tissue by contracting reflexly, —the so-called *défense musculaire.* In cases of violent and very extensive peritoneal irritation, the abdomen is hard as a board, and the respiration costal, *i.e.* the abdominal muscles and the diaphragm are in a state of tonic contraction. In this way the range of movement of the abdominal organs is greatly diminished, and thereby also the abdominal pain. Compare herewith the endeavour of patients suffering from severe abdominal pain to obtain relief by lying on the "belly," or by fixing something tightly round the "stomach." The extension of the reflex muscular rigidity corresponds pretty nearly to the area of peritoneal irritation of the serous membrane of the anterior abdominal wall. I do not believe that we know very much about the *défense musculaire* in connection with a mechanical ileus before peritonitis sets it. It is necessary to observe carefully every case of severe colicky pains attending an intestinal stricture, in order to see whether a tonic contraction of the abdominal muscles and diaphragm takes place, diminishing the movements of the bowels and indirectly the severity of the pain.

In acute inflammatory diseases of the abdomen I have not found hyperalgesia of the skin as often as one might think, remembering Dieulafoy's *triade douloureuse* of acute appendicitis: cutaneous hyperalgesia, reflex muscular rigidity, and tenderness on pressure. With regard to the cutaneous hyperalgesia, I think that before applying Head's theory to a given case, one ought to consider the question whether in that special case an infectious lymphangitis along the posterior abdominal wall and the vertebral column might not cause a hyperæsthesia of the sensitive nerve trunks and the spinal ganglia of that region. It will be clear to every one that this is only a hypothesis to work upon. In those few cases of acute appendicitis with cutaneous hyperalgesia which have come under my care since I began to pay attention to this matter, I have observed, so far as I can remember, a coexisting tenderness on deep pressure in the angle between the twelfth rib and the erector spinæ, or somewhat lower down at the border of this muscle.

When considering the pains connected with infective diseases of the liver and gall bladder, one has to remember that well-known embryological facts, my own researches and the investigations of Ramström, all lead to the assumption that the liver, the gall bladder, and the extra-hepatic bile passages are without nerves of pain. One has further to consider the distribution of the lymph vessels of these organs in the posterior abdominal wall and diaphragm, as well as their anastomoses with the lymphatics of the duodenum and pancreas. Remembering this, it is easy to understand that infective diseases of the liver and gall bladder are apt to be followed by spasms of the diaphragm, and that the movements of the common bile duct, the duodenum, and stomach may be attended by pain. When the gall bladder contracts spasmodically in order to expel its contents, there will be a stretching of the cystic and common bile ducts, and a stretching of the parietal peritoneum and the sensitive retroperitoneal connective tissue around the common bile duct. If a tube has been fixed watertightly into the gall bladder in a case of cystostomy for cholecystitis, 100 c.c. or more of saline solution may be made to pass from the gall bladder into the duodenum—the biliary passages being free—without the patient feeling anything, as long as the solution is being injected into the gall bladder sufficiently slowly. If the injection is made with a little greater force, the patient almost immediately complains of colicky pain and of pain in the back.

With a shrunken gall bladder and a very wide common bile duct, biliary colic due to the stretching or distension of the common bile duct is inconceivable.

It is necessary to consider carefully the account which the patient gives of his pain. Lately a patient of mine suffering from an acute hæmorrhagic pancreatitis, stated that the attack of pain began with a sensation as if the large blood vessel at the back had burst near the pit of the stomach. The autopsy showed, besides pancreatic hæmorrhage, a large retroperitoneal hæmorrhage around the cœliac axis and the aorta.

One must never forget how difficult it is to localise pain, and to how great an extent the correct localisation of painful sensations is a matter of practice.

SUMMING UP.—In estimating abdominal pain, and especially pain in connection with lesions causing the symptoms of ileus, one has briefly to remember:

1. That pains do not originate within the abdominal organs which are supplied only by the sympathetic cord and the vagus nerve; that, on the contrary,

2. All pains originate in the abdominal wall, more especially in the parietal serous membrane and subserous connective tissue, which are innervated by the cerebro-spinal nerves;

3. That every stretching of the parietal attachments of the stomach and intestines, *i.e.* of the mesenteries as well as of adhesions to the abdominal wall, is very painful;

4. That the same applies to the displacement or stretching of the parietal serous membrane in relation to the muscles or aponeuroses of the abdominal wall;

5. That most of the lesions causing obstruction are at first attended by increased and, as a rule, irregular peristalsis;

6. That chemically different substances, such as the contents of the stomach, gall bladder, bowel, or of an abscess, when they come into contact with a healthy or hyperæmic parietal peritoneum, give rise to severe pain;

7. That even that form of acute peritonitis which goes under the name of "peritoneal irritation" greatly increases the sensitiveness of the parietal serous membrane;

8. That the sensitiveness of the parietal peritoneum increases at the same rate as the inflammation, but decreases again when the inflammation has reached a certain degree, and may ultimately in many cases cease. Compare herewith erysipelas of the skin, more especially the gangrenous kind.

I believe that we are on the right way to understand the pains of "ileus," but here an enormous amount of work still remains to be done. I consider it to be a very happy "hit" to bring together anatomists, physiologists, physicians, and surgeons for the discussion of this question. I feel not only greatly honoured, but also deeply grateful for the invitation to contribute one of the introductory papers.

THREE CASES OF FATAL STRYCHNINE POISONING.

By HARVEY LITTLEJOHN, M.B., F.R.C.S.Ed., and T. W. DRINKWATER, L.R.C.S.Ed., F.I.C., etc.

ALTHOUGH cases of fatal poisoning by strychnine are by no means rare, yet they are uncommon enough to justify their being recorded, more especially when it is possible to supplement an account of the symptoms, with the result of the post-mortem examination and of the chemical analysis.

This we are able to do in two of the cases now reported; in the third, unfortunately, no post-mortem examination was authorised, and it is merely included as an illustration of how accidental poisoning with this substance may occur.

The circumstances attending this last case were as follows:—

CASE 1.—A lady, æt. 36, had been complaining of illness for some time, which developed into phthisis, and her medical attendant prescribed for her a mixture of equal parts of the liquor arsenicalis and liquor strychniæ—six drops to be taken in water three times a day. The druggist dispensed the prescription, giving her a 1-oz. bottle of the mixture. She had already taken one bottle of the medicine, it was stated, with good results, and had finished the second bottle, with the exception of a little sediment and a few drops of the liquid. On getting up one morning, she did not feel very well, and thought she would take some of the medicine; but finding the bottle apparently empty, she added some water, shook it up, and drank it off.

This was at 10 A.M. About an hour afterwards she complained of feeling ill, and of not being able to walk. She lay down, and shortly afterwards had a convulsion. Her medical attendant was sent for, and when he arrived she was lying in bed, her face betraying great anxiety. She told him what she had taken, and said she was afraid she "had done for herself." The slightest touch caused a convulsive seizure, and the doctor states that the mere opening of the door of her bedroom on his arrival caused a severe tetanic convulsion. When this passed off, she was able to speak; but just as he was leaving to fetch some chloroform, she took another seizure, and died in it, at 12.20 P.M.

Unfortunately, no post-mortem examination was ordered, and the procurator-fiscal merely called upon one of us to report to him upon the circumstances attendant upon what was evidently a case of death from strychnine. This report indicated the mistake which the medical attendant had committed in prescribing an incompatible mixture, and also pointed out the further error on the part of the druggist in dispensing the prescription. After due investigation, the Crown decided to take no further judicial action.

It is difficult to decide whether the doctor or the druggist was more to blame, although the latter appears to us to have been more culpable, since questions of incompatibility of drugs form part of the elementary knowledge required for his profession, and it is his duty to notice errors in prescribing, and to refuse to dispense a mixture which he ought to have known was likely to prove dangerous, and more especially the prescription in question, the incompatibility of which is specifically referred to in most works on pharmacy.

It is of some interest to note that the first bottle of the mixture was taken without any untoward effect, and it was only the accidental circumstance of the sediment in the second being shaken up with water that led to the fatal result.

The bottle was examined, and found to contain two or three drops of fluid, together with a few crystalline particles, which, on analysis, was proved to consist of 4 mgrms. of strychnine.

It is impossible to say definitely how much strychnine the deceased took, because, although practically the whole of the strychnine (a little over 2 grs.) contained in the ½ oz. of liquor strychniæ would be precipitated in the course of a very short time, yet the words "Shake the bottle" on the phial, if carried out by the deceased, may have led to a portion of the precipitated strychnine being swallowed before the final catastrophe.

The fact that the onset of the symptoms was delayed for so long would also appear to indicate that a smaller dose than 2 grs. was taken.

The *second case* was also the result of accident, and the circumstances were equally tragic.

CASE 2.—A married lady, æt. 30, had given birth to a child seven weeks before. The puerperium was normal, but latterly she had suffered from influenza and neuralgia, for which her medical attendant prescribed powders, consisting of sulphate of quinine 5 grs., phenacetine 5 grs., and exalgine 1 gr., one powder to be taken at intervals of five hours until relief was obtained.

On the morning of the occurrence, the powders being finished, the deceased asked her husband to take the prescription to the druggist on his way to business at 9 A.M., and order six powders to be sent to the house. This he did, and in the course of a short time the powders arrived.

The deceased was dressing in her room, along with her baby and nurse, and the latter stated that the deceased placed one of the powders in her mouth and washed it down with a drink of water. Within a few minutes (five minutes) she asked the nurse to give her a drink of water, saying that she felt rather sick and faint. She then asked to be helped to bed. When she spoke, her jaws seemed close and stiff. She complained of pain over the heart, and asked for her hands to be held; and about a quarter of an hour after taking the powder she screamed out and passed into a general convulsion, at first throwing about her arms, and then the whole body became stiff. Her eyes were open and staring, the face was cyanosed; lips blue; there was froth at the mouth, the legs and trunk were rigid, the arms stiff and flexed on the body, the head thrown back, and, according to the nurse, she was quite unconscious during the seizure.

The convulsion lasted about a minute and a half. She then spoke, saying that she was afraid she was going to die, and asked her sister to look after the child, and to send for her husband. When her sister touched her she had a second convulsive attack, the same as the previous one, and was again apparently unconscious. Her brother, who arrived in a short time, stated that she appeared to be suffering intensely, and was in a state of great agitation, rolling her head about a great deal, and complaining of pain over the heart. Her face was moist from perspiration, and the pulse very fast. She gave a cry, and took a third seizure; she was unconscious, the jaws being firmly clenched; the arms were at first thrown about, then the body became rigid and arched, so that it rested on the heels and back of the head.

When the doctor arrived, she was in a fourth convulsion, and he states that she was absolutely insensible, frothing at the mouth, the face of a deep livid colour, the eyes open and the pupils dilated, and after a slight tremor of the body she died. The duration of time from the taking of the powder until death occurred was not more than thirty-five minutes.

The doctor stated that the body was quite stiff and rigid immediately after death, and that it was in this condition when he left the house an hour later. He had great difficulty in forcibly bending the arms into a straight position, and the neck, which was arched, could not be moved.

On the following day, twenty-six hours after death, a post-mortem examination was performed.

The body was well nourished. Skin slightly jaundiced. Face placid, pale; lips pale, pupils dilated, conjunctivæ pale, no petechial hæmorrhages. Well-marked post-mortem lividity. Jaws somewhat stiff. Neck mobile. Slight rigidity of arms (possibly rigidity had been partially destroyed by the doctor on the previous day or during the subsequent dressing of the body); hands tightly clenched; marked rigidity of legs, and the feet extremely inverted. Abdominal muscles flaccid.

Heart.—Right auricle and ventricle distended with dark fluid blood; left ventricle flaccid, not contracted, and containing some fluid blood; muscle soft, pale, and friable; otherwise the heart was healthy.

Lungs collapsed, numerous subpleural ecchymoses; on section, engorged with dark blood, and throughout the lung substance several large patches of a bright red colour, which were also evident on the pleural substances; bronchi full of frothy fluid.

Liver, *spleen*, *kidneys*, and *pancreas* engorged with dark fluid blood.

Stomach contained about 2 oz. of grey-coloured fluid. The mucous membrane was pale except in an area the size of an orange at the greater curvature, near the cardiac end, where there were numerous small extravasations of blood and marked hyperæmia.

The *intestines* were normal in appearance.

The *meninges* and the *brain substance* were markedly congested.

Chemical Analysis. — 1. The stomach contents measured 42 c.c.; they were acid in reaction, and consisted of a buff-coloured grumous fluid, with no characteristic odour; 20 c.c. were submitted to analysis by the Stas-Otto process for the extraction of alkaloids, and gave no evidence of the presence of strychnine.

2. The amount of blood obtained was 115 c.c. Of this, 50 c.c. were taken, and when treated by the same process gave a characteristic colour reaction with bichromate of potassium and sulphuric acid.

3. Half the stomach was treated in a similar manner, and afforded distinct evidence of the presence of strychnine.

4. 135 c.c. of the semi-fluid, putrescent liver gave no indication of the presence of strychnine.

Thus it is seen that although the stomach contents and liver failed to afford any evidence of the presence of strychnine, yet the poison was found in the stomach itself and also in the blood. Two years later the remaining (pyloric) half of the stomach was examined, and was found to give the characteristic reaction of strychnine with the bichromate and sulphuric acid test, although it was not so distinct as that afforded by the cardiac end two years before. 25 c.c. of the blood failed to give any indication of the presence of strychnine when examined four years later.

5. The powders were also submitted to analysis, and were found to correspond with the prescription, except that in place of 1 gr. of exalgine there was in each powder 1 gr. of strychnine. A point of interest arose in connection with the examination of the powders, namely, that the bichromate and sulphuric acid test gave no strychnine reaction when applied directly to them. This was found to be due to the presence of the phenacetine. Although brucine and morphine in certain proportions have been found to obscure the reaction, we can find no reference to a similar effect being caused by phenacetine. Other substances when mixed with strychnine, such as exalgine, sulphonal, trional, antipyrin, and antifebrin, do not apparently interfere with the test.

With the object of determining what proportion of phenacetine when mixed with strychnine prevents the development of the colour reaction, we have made a series of experiments with each of the usual oxidising agents, bichromate of potassium, peroxide of lead, manganese dioxide, and permanganate of potassium.

We find that bichromate of potassium gives no reaction when phenacetine is present in the proportion of three parts to one of strychnine; while even when the proportion is two to one, the purple colour is so indefinite as to preclude any decisive opinion being formed as to the presence of strychnine in the mixture.

The three other oxidising agents are slightly more delicate, manganese dioxide and permanganate of potassium giving a distinct purple colour when the proportion of phenacetine is four to one of strychnine; but in mixtures containing a larger proportion of phenacetine, the results were negative with all the above reagents.

As a result of inquiry, it appeared that an unqualified druggist's assistant made up the powders, and that in the poison cupboard the bottles of exalgine and strychnine were in close juxtaposition, and that he had dispensed the latter instead of exalgine. He was tried on a charge of culpable homicide, and acquitted.

The points of interest in the foregoing case are the definite dose of 1 gr. which caused death in thirty-five minutes, the onset of the first symptoms of illness in five minutes, and the detection of strychnine in the stomach and blood, while it was absent in the stomach contents and liver. Finally, it is worthy of note that two years later the presence of strychnine was still clearly indicated in the stomach, while the examination of the blood after four years proved negative. This might be accounted for, however, by the small quantity of blood operated on.

The *third case* to which we propose to refer is the recent one which gained some notoriety, and is known as the Cumnock Shortbread Poisoning Case.

CASE 3.—On 19th November 1906, a parcel arrived by post addressed to Mr. William Lennox at Old Cumnock, which on being opened was found to consist of a tin box containing a cake of shortbread covered with a layer of white sugar. The shortbread was not touched until the evening of the 23rd, when it was partaken of by four people, namely, Mr. Lennox, æt. 78; a lady, Grace M'Kerrow, 56; a visitor, Mrs. Bain, 80; and the servant, a girl of 14. They, however, only ate a very small piece, probably not bigger than a square inch, since when the cake was received for analysis it was practically intact. The reason for this lay in the fact that it tasted so bitter, and therefore was thought not to be good and put aside.

In ten minutes Miss M'Kerrow complained of feeling faint and dizzy, and looked very white and ill. Mr. Lennox stated that immediately afterwards he also felt queer, and when he tried to rise and go to her assistance he found himself unable to do so, as his legs were stiff and he could not straighten them. He said that he was all in a shiver, and subsequently he had several tetanic spasms, which gradually passed off after he had received an emetic and vomited.

Miss M'Kerrow called out to the servant to go for a doctor, and when the servant came into the room she states that she saw that Miss M'Kerrow was stretched straight out on the chair, her legs and arms stiff and extended, and hands tightly clenched. She then seemed to lose the stiffness and sat up in her chair again. Miss M'Kerrow cried as if in pain, and said she was poisoned. She told her to go for a doctor. Mrs. Bain also now began to feel ill, and her arms and legs became stiff. She was shaking, and could only walk with assistance.

The servant went for the doctor, and on returning says she felt her arms and legs getting stiff, so that she could hardly move her legs or bend the knees. She sat down and could not raise herself again, and was found by some passers-by, who assisted her home.

When the doctor arrived he says that he found Miss M'Kerrow sitting in a chair twitching violently, and apparently in great suffering. She went into a general tetanic convulsion, so that the hips were lifted from the chair and the body rested with the head on the back of the chair and the heels on the ground.

She was perfectly unconscious during the spasm—deeply cyanosed, with dilated pupils. He gave an emetic, which she was able to swallow, but with no result, as her mouth and jaws then became rigid. The patient herself afterwards tried to produce vomiting by tickling her throat, but without success. He then injected apomorphine without result, and also succeeded in passing a stomach tube, which, however, became clenched between her teeth. She gradually grew worse, and died about an hour and a half after taking the shortbread.

Mrs. Bain was removed to her own home, and for at least four hours the doctor regarded her life to be in danger, but she was made to vomit freely, and gradually the spasms and rigidity of the limbs passed off. For several hours she talked incessantly, and was in a very excited condition. She asked that no one should touch her, saying that it would bring on a spasm. Next day she still complained of stiffness in her legs and arms, and she was found to be suffering from a congestion of the bases of both lungs, from which she recovered in ten days.

The servant, on being made to vomit and put to bed, was practically well next morning, although there was still a feeling of stiffness in the limbs. She stated that she only ate a small portion of the shortbread, about the size of a pea, which she found on one of the plates used at supper, and that she spat it out at once as it was so bitter.

An interesting sequel in the case of one of the patients was that he complained of his muscles being stiff and sore, and that about a month afterwards he consulted his doctor on account of inability to perform certain movements with his arms, but more especially the left. Marked atrophy of both deltoid and biceps muscles, and of his left triceps, was found to be present. This has slowly improved, but although six months have elapsed since the poisoning, the movements of the left arm are still somewhat impaired.

A post-mortem examination was made by Dr. M'Queen on the body of Miss M'Kerrow upon the 26th of November, the third day after death, and the following particulars are taken from his report:—

The body was well nourished; fingers of both hands were firmly clenched; the wrist joints were slightly flexed and rigid; with these exceptions the upper limbs were practically free from rigidity. The lower limbs were rigid, with the feet firmly flexed and inverted. The rigidity was less marked round the hips than in the lower parts of the legs. There was no distortion of the face, and the muscles of the lower jaw were flaccid. The pupils were widely dilated and equal. The heart contained about an ounce of dark fluid blood in the right ventricle; the left ventricle was firmly contracted. The stomach contained four and a half ounces of food of the consistence of porridge. The mucous membrane was pale and intact except over an area the size of the palm of the hand at the cardiac end of the greater curvature, which was denuded of mucous membrane, and of a black colour. This was probably a putrefactive change.

The other organs of the body showed marked venous engorgement, and were otherwise normal.

CHEMICAL ANALYSIS.—The shortbread and organs of the body were received for analysis, besides various other articles found in the house of the accused man Brown.

The shortbread was covered with an icing of sugar, which was roughly put on, and evidently by an inexperienced person. On tasting this icing, it was found to be extremely bitter, the characteristic bitterness of strychnine remaining in the mouth for several hours afterwards.

On analysis, the icing was found to consist of sugar and 41 per cent. of strychnine, which was present in the form of the alkaloid. The shortbread itself contained no strychnine. It was estimated that the total quantity of strychnine present in the icing on the whole cake was not less than 120 grs. This large amount explains how such a very small quantity of the cake produced a fatal result in one instance and serious symptoms of poisoning in three other persons, and it is quite possible that the deceased Miss M'Kerrow may have swallowed a grain or even a larger amount of strychnine in the small portion eaten.

Analyses were made separately of the brain, blood, stomach contents, stomach, contents of small intestine, kidney, and liver, and in all the final residues resulting from the Stas-Otto process gave, with bichromate of potassium and sulphuric acid, the characteristic colour reaction of strychnine. The strychnine thus obtained was present in too small a quantity to permit of weighing, but in the case of the stomach, stomach contents, and liver, the respective residues had the characteristic crystalline form of strychnine obtained from a chloroform solution, and they tasted bitter. The next most marked evidence of the presence of strychnine was obtained in the blood and kidney, and the smallest amount appeared to be present in the contents of the small intestine and brain.

In connection with the colour test for strychnine when present in very minute quantity in the final residue after extraction by the Stas-Otto process, we have found bichromate of potassium by far the most satisfactory reagent when it is employed in solution in the manner recommended by Otto. This consists in pouring over the final residue contained on a watch glass some weak bichromate solution, and allowing it to remain there for about a minute. This is then poured off and any fluid which remains is carefully absorbed with filter paper. The residue will show a yellow staining if strychnine is present, and on pouring over it strong sulphuric acid the purple colour immediately appears. We found this method of procedure much more delicate in the presence of a very minute trace of strychnine than when a small crystal of bichromate is employed in the ordinary manner, or any of the other oxidising agents substituted for it.

On 18th March the prisoner accused of sending the shortbread was tried in the High Court of Justiciary. The evidence against him was purely circumstantial, and was not conclusive. He was proved to be in possession of an ounce of strychnine, which he had purchased a few months before for the ostensible purpose of destroying rats; but the purchase of the shortbread, its despatch by post, and the identity of the handwriting of the address on the parcel, were points which were not cleared up.

A question of considerable interest arose in connection with the procedure adopted by the Crown in the case, and it has given rise to much discussion in the press.

The accused man Brown had been subject to epileptic fits for forty years, and after his arrest the Crown, as a result of the information which resulted from their investigations, caused an inquiry to be made by two lunacy experts into his mental condition.

As a result of this inquiry, they were of opinion that the accused was insane, and, while in many ways perfectly rational, yet that he showed signs of such mental deterioration as to justify his being regarded as insane, and therefore unable to give instructions for his defence.

At the first or pleading diet before the Sheriff, accordingly, the Crown produced a medical certificate by the two doctors, certifying the prisoner to be insane and therefore incapable of pleading to the indictment. To this the prisoner's agent objected, on the ground that he was quite capable of pleading.

The Sheriff referred the case to the High Court for disposal, and here again the Crown argued that the prisoner should not be allowed to plead in view of the medical certificate of insanity, and this was strenuously opposed by counsel for the defence, who maintained that the prisoner was entitled and ought to be allowed to plead.

The Court held that it was competent for an investigation into the sanity of a panel to precede trial on indictment by jury, but that in the circumstances of this case this procedure was inexpedient, and that to allow a plea to be taken would not prejudice the case. The prisoner accordingly pled " Not guilty," and evidence was led.

Various facts came out at the trial, in addition to the evidence of the prisoner's medical attendant and of the two medical witnesses for the Crown, who had specially examined the prisoner, which plainly pointed to mental unsoundness.

The Lord Justice-General in his summing up enunciated a view of what constitutes insanity, which appears to go further than and be in advance of previous judicial pronouncements upon the subject, and which has been hailed by many as indicating a more just appreciation of the present medical conception of insanity, and of the more recent advances in our knowledge of scientific psychiatry, than has hitherto obtained.

The Lord Justice-General in charging the jury said: "It was well recognised that although science has not yet taught us sufficient about the brain to know on what insanity depends, yet it was a perfectly possible thing to have a person who may for all purposes be as sane as any one on nearly every matter, and yet, upon one point, be hopelessly insane. . . . On this question for your determination of whether the prisoner is or is not insane, I must consider with you what that class of insanity means. It means insanity which prevents a man from doing what a truly sane man would do and is entitled to do—maintain in sober sanity his plea of innocence and instruct those who defend him as a truly sane man would do."

This goes further than Sir James Stephen's dictum: "No act is a crime if the prisoner who does it is at the time when it is done prevented, either by defective mental power or by any disease affecting his mind, from controlling his own conduct, unless the absence of the power to control has been produced by his own default."

The Lord Justice-General's pronouncement is free from the qualification in the last sentence of Sir J. Stephen's, and is likely to form an important precedent in Scotland.

The jury found that the accused Brown "was now insane," and he accordingly was ordered to be detained during His Majesty's pleasure.

Many critics have expressed dissatisfaction with the verdict, inasmuch as the accused having been allowed to plead to the charge they hold that a verdict as to his guilt or innocence should have been returned, and, if found innocent, he would thus have been relieved from the stigma of having committed the alleged crime. Under the 87th section of the Lunacy Act of 1857 (20 & 21 Vict. cap. 71, sec. 87), which states that if a person on trial "appears to the jury to be insane, the Court shall direct a verdict to that effect to be recorded, and thereupon shall order such person to be kept in strict custody until Her Majesty's pleasure be known," it is apparent that the verdict was a perfectly proper one. Those who object to it say that when the Act of fifty years ago was passed, the Legislature did not contemplate its application to the circumstances of a case like the present one, and that it was intended to apply to the case of a person becoming insane during his trial. The Act, however, does not say so, and I think the majority will agree that the law as it stands leaves little to be desired for dealing with prisoners accused of crime, and is calculated to meet fairly any cases which may arise.

A CASE OF ANEURYSMAL DISEASE, WITH OBSERVATIONS.

By CECIL F. BEADLES.[1]

(PLATES III. AND IV.)

SUMMARY.—Multiple small aneurysmal dilatations on the larger arteries at the base of the brain affected with syphilitic endarteritis, syphilitic deposits and softenings in both cerebral hemispheres, symmetrical aneurysms at the bifurcation of both common carotid arteries, great localised dilatation with thrombosis of both coronary arteries, in a patient presenting the clinical symptoms of general paralysis.

HISTORY.—J. J., a married man, æt. 38, tailor by occupation, was admitted to Claybury Asylum on 10th February 1903, on the following medical certificates:—" (*a*) Prematurely aged, appeared to be suffering from softening of the brain and subject to what may be described as melancholic stupor. Is certainly irresponsible and unfit to be at large. (*b*) Wife states: during the night he will use obscene language, calling me a whore. This is unnatural of him. Neglects his person, and is sometimes violent."

Particulars obtained from the wife are to the effect that the patient's mind had been affected for twelve months, but he had not before been confined in an asylum. The only cause that could be attributed was ill-health. He had had rheumatic gout, and ten years ago had influenza. Was steady in habits. An aunt on father's side had been insane. Married for fourteen years, and had two children (twins), æt. 13 years. The first sign of mental disorder noticed was loss of memory; had been violent towards her; forgot his work. Of late he had been the reverse of cheerful. He could sleep at any time, and his appetite had been very good ever since his illness began.

PRESENT STATE ON ADMISSION, BY DR. PUGH.—Lipoma on both wrists. Tongue flabby, finely tremulous. Heart sounds clear. Breathing vesicular, no accompaniments. Pupils unequal, left contracted, light reflexes sluggish. Knee-jerks brisk, and plantar reflexes exaggerated. No paralysis of limbs and no sign of paresis of face, but gait unsteady and muscular co-ordination impaired. Speech slurred and indistinct, and power of articulation impaired. Lies in bed in supine position. Has a fatuous expression, is restless, irritable, and bad tempered. Mental reaction slow; answers questions in a hesitating manner; ideas slowly formed, and are very confused. Expresses delusions freely; says that "his wife is a wicked woman, that she wanted and attempted to kill him." Mistakes identity of persons. Memory much impaired both for recent and remote events, and has no knowledge of time or place.

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[1] I am greatly indebted to Dr. G. A. Watson in connection with this case; first for allowing me to use his post-mortem notes, and secondly for assistance in the preparation and examination of the microscopical sections. I have also to thank Dr. Mott for placing the material at my disposal, and Dr. Robert Jones and Dr. Pugh for enabling me to use the clinical notes. For the opinions expressed in this paper, I alone am responsible.

FURTHER NOTES.—*February* 16.—The following note is by Dr. Robert Jones:—"He is suffering from melancholia. He is slow to reply to questions, dull and very reserved. His memory is impaired, and he is unable to give his history. He is very disinclined to speak. Does not take any interest in his surroundings, and is regardless of his personal appearance. He is in poor health and condition. Looks 60 years of age. Denies syphilis." *February* 23.—In a confused and demented state; has no idea of time or place; health poor; gait unsteady; wet and dirty in his habits. *March* 3.—Is in much the same mental state. Physically he is going down hill. Eats and sleeps well. *March* 10.—Continues lost, confused, and very demented. He is in delicate health, and is a well-marked general paralytic. Prematurely old. *May* 12.—Mentally in the same grossly demented state; physically as feeble, very shaky. Wet and dirty in his habits. *June* 12.—Continues in much the same state. The last week he has been very talkative, and has developed grandiose ideas; says he has millions of pounds and a diamond coat. *September* 30.—He has had numerous *seizures* lately, and has been quite helpless in bed. *December* 11.—Continues in much the same lost and demented state; health feeble.

NOTE BY DR. JONES.—*January* 9, 1904.—"He is suffering from dementia paralytica. He is lost, confused, grandiose, and flippant. He is intensely deluded, thinks he has no end of wealth, that he is a strong man. Memory defective; has no ideas of time or place. Poorly nourished." *February* 21.—Died, the cause of death being returned as "Exhaustion of general paralysis, phthisis, and multiple aneurysms."

Dr. Pugh, who for the most part had this patient under his care, informs me that the patient had all the characters of an ordinary case of general paralysis. There was no seizure immediately preceding death. Throughout the whole time he was under observation no paralysis either of limbs or face was noticeable. The eyes presented no abnormality beyond the inquality of pupils and feeble reaction to light. No defect was detected of any of the special senses. Patient acknowledged having had syphilis and having *drunk* to excess.

POST-MORTEM BY DR. G. A. WATSON.—*External appearances.*—Subject's age is given as 38, but he looks more like 60 years of age. Hair and beard greyish-white. Emaciated. Muscular system poor. Palate high and broad. No arcus senilis. Pupils very irregular in contour; left the largest. Two small scars over sacrum; two or three pigmented scars on legs. No definite external marks of syphilis. No definite scar on penis. Inguinal glands shotty on both sides.

Head.—Skull: diploe well marked, very congested. Dura somewhat thickened. Considerable excess of cerebro-spinal fluid. Pia arachnoid: considerable thickening and much general opacity, partly due to gummatous deposit, most marked in fronto-parietal region; very firm and extensive midline prefrontal adhesions; stripped with some difficulty; marked decortication over upper part of motor area, portions of superior and inferior parietal, temporal and insula. The thickening and opacity, with what was believed to be gummatous deposit, for the most part followed the course of the larger veins down the fissures, and especially down the whole length of the great anastomotic vein of Trolard. At the base the membrane was not excessively thickened, and did not exhibit any marked degree of this specific deposit. No excess of fluid in subarachnoid space. Vessels: arteries markedly dilated and atheromatous. Many of the vessels show nodular thickenings, and there are several aneurysmal dilatations. The largest is about the size of a haricot bean at anterior end of basilar artery. These will again be referred to more fully. Encephalon: convolutions of about average complexity, gyri rather large; fairly well-marked general wasting, mostly in the prefrontal region, cortical depth markedly diminished, and striation indistinct. White matter very œdematous. In the central white matter of right hemisphere was an area of softening surrounded by some rather dense white putty-like material, believed to be gummatous. Also two or three areas of softening and putty-like deposits of similar character in the central grey ganglia. In the hinder part of the lenticular nucleus of the corpus striatum one of these areas has broken down and produced a cavity, with ragged edges, the size of a hazel-nut. Ventricles considerably dilated; choroid plexuses thickened but not cystic; numerous medium and large granulations on ependyma of lateral, third, and fifth ventricles, and universal large granulations in fourth ventricle uniformally all over the floor. No abnormality was observed about the cerebellum, pons, and medulla on their outer aspects. Cranial nerves apparently normal. Spinal cord not examined. The brain as a whole, on immediate removal from the skull, weighed 1455 grms. On dividing the several parts and allowing the fluid to escape from ventricles, the weights were—right cerebral hemisphere, 555 grms.; left hemisphere, 608 grms.; cerebellum, pons, and medulla, 180 grms. The left cerebral hemisphere stripped of its membranes, 575, giving a loss of 33 grms.

Thyroid gland enlarged; the left lobe contained a cyst the size of a cherry, containing thick glairy brown fluid. Cervical glands not enlarged.

Thoracic organs.—Both lungs presented slight apical adhesions, and on the left side pleuritic adhesions of the posterior border. Bronchial glands enlarged but none caseous or calcareous. Bronchi thickened and contained muco-purulent material. The right apex had a depressed scar with area of fibrosis; several small scattered calcareous nodules in upper lobe and two or three small caseating areas. The left upper lobe riddled with many irregular walled cavities communicating with one another, most numerous near apex, and considerable fibrosis; intervening areas caseating or pneumonic. The lower lobe of both lungs the seat of extensive broncho-pneumonia.

Heart enlarged, especially left side; weight, 378 grms. Left ventricle hypertrophied, muscle firm; auricle somewhat dilated. Right ventricle about natural, contained much white and a little red clot. Tricuspid and pulmonary valves healthy. Flaps of mitral valve slightly thickened at their edges. Cusps of aortic valve considerably thickened, especially the right posterior cusp, behind which the sinus of Valsalva is much dilated. The bulging amounts almost to an aneurysmal dilatation which will contain a full-sized cherry. Coronary arteries: both much dilated. The right on being laid open measures $\frac{3}{4}$ to $\frac{7}{8}$ in. across; its walls contain very extensive atheroma and a little calcareous deposit.

The left coronary is also considerably dilated and its walls similarly diseased; near its commencement it is completely plugged by a dense thrombus for a distance of ½ to ¾ in.

Aorta and great vessels.—Wall of arch and thoracic aorta thickened and contained a moderate amount of pearly white fibrosis, generally distributed, for the most part the first stage of atheroma; no calcareous deposit. The abdominal part of the vessel was in a similar condition. Both renal arteries were much thickened. In the arch between the left subclavian and left carotid was a minute pouch pointing in an upward direction. At the bifurcation of each common carotid artery is an aneurysm; that on the right side in the form of a globular swelling, sacculated and of the size of a cherry; that on the left more fusiform, in shape and size resembling a Brazil-nut. The one on the right was placed more particularly at the origin of the external carotid, while that on the left was at the commencement of the internal carotid. Both filled with dense clot. These aneurysmal dilatations of the carotid arteries are shown in the accompanying figure, which is reproduced from a photograph (Plate III., Fig. 1).

Abdominal organs.—Liver weighed 1485 grms.; spleen, 160 grms.; the density of both these organs considerably increased due to fibrosis. Right kidney 140, and left kidney 163 grms.; both very congested, surface mottled and granular, capsule somewhat thickened, density of organs greatly increased, vessels much thickened. The left contained a small cyst. Lining of stomach in a catarrhal condition. Some slight chronic catarrh and patchy congestion of small intestine. Large intestine somewhat dilated throughout, wall thickened, mucosa atrophied, but no evidence of old or recent ulceration. Mesenteric glands slightly enlarged, not caseous or calcareous. Bladder greatly hypertrophied; chronic cystitis.

The immediate cause of death was "cardiac failure, thrombosis of left coronary artery, and tuberculosis of lungs." Other pathological conditions are summarised as, "general paralysis, multiple aneurysms of cerebral vessels, multiple central cerebral softenings and gummata, fibrosis of organs—kidneys, spleen, and liver."

Further Examination of the Cerebral Arteries and the Brain.—Plate IV., Fig. 2, is a representation of the arteries from the base of the brain. Those of the left side, which in the illustration are seen to the right, appear to be slightly more dilated than those of the other side. There is also seen a second anterior communicating vessel between the anterior cerebrals, three-quarters of an inch in front of that at the usual site. Upon the vessels which form the circle of Willis and upon their immediate branches there can be made out at least eight distinct aneurysmal dilatations, as follows:—

1. The largest dilatation is at the anterior extremity of the basilar; it presents the form of a pocket with a thinner broad base in front, becoming more bulged and rounded posteriorly. It measures 1·5 cm. by 1·2 cm. The whole circumference of the vessel is involved. The trunk of the basilar enters the dilatation centrally from behind, and the posterior cerebral arteries pass out from it in front by constricted channels. The two superior cerebellar arteries arise from the sac itself. The wall of the aneurysm is tense and hard, and upon incising it the cavity

was found filled with pale, laminated clot, which seemed to have occluded the entire lumen.

2. A slight fusiform dilatation exists at the hinder or lower end of the basilar, just after the vertebrals have united. Here the vessel measures 6 mm. across, as compared with 3 mm. where it enters the larger aneurysm described above.

3. A small fusiform dilatation on the left vertebral artery, the centre of which is 4 mm. across, and 1 in. below the upper termination of the artery.

4. A general distension of the coats of the left internal carotid artery from the point where it enters the cranial cavity to where the first vessels are given off. This is fusiform, and measures 6 mm. across. There is a slight general thickening around the whole circumference of the vessel walls, which are firm and rigid. The corresponding artery on the opposite side is also slightly dilated, but to a less degree.

5. A minute bulging on the right middle cerebral immediately after the anterior cerebral has been given off.

6. A dilatation at the origin of one of the branches of the same artery while in the sylvian fissure—probably the ascending frontal branch. The vessel is here 4 mm. across, compared to 2 mm., which would seem to be the natural diameter.

7. A small bulbous dilatation, 5 mm. across, at the fork between the two final main branches—probably the ascending parietal and the temporo-parietal branches.

8. A minute dilatation of the left anterior cerebral at its junction with the anterior communicating. At the site of 5, 6, and 7 the walls of the affected vessel are thickened, opaque, and hard, the lumen apparently occluded by thrombi, and the circulation completely cut off.

After the brain had been preserved in formalin solution about three weeks, a more thorough examination was made. By carrying vertical transverse incisions through both hemispheres at intervals of about ¼ in., a number of areas of softening were found.

In the left cerebral hemisphere there was a small area about the size of a sago grain at the base of the calloso-marginal sulcus, on a vertical plane with the extreme anterior end of the genu of the corpus callosum. This involved both the grey cortex and the white matter. About half a dozen others were situated in the white matter of the occipital lobe and posterior part of the parietal of this hemisphere. These were all of small size, and, for the most part, of a triangular shape, the longest macroscopic measurement not extending more than ⅓ in. They lay in the white matter, not far from the grey cortex, but not involving it. In most of these the softening immediately surrounded a somewhat dilated blood vessel. The basal ganglia in this hemisphere presented no visible lesion.

The right hemisphere contained no spots of softening in the hinder part. A section, immediately in front of the optic commissure, discloses an irregular cavity, ¾ in. vertically and ¼ in. across, situated in the outer part of the corpus striatum. This has been formed by the breaking down of the brain substance and, apparently, the softening of adventitious tissue. Part of the nucleus caudatus, the putamen of the nucleus lenticularis, and between these the internal capsule has been entirely destroyed. By means of other sections it is found that this cavity extends in an antero-posterior direction for about ¾ in. In the fresh state the cavity seemed more ragged, and more or less filled with disintegrated tissue. The remainder of the grey matter of the lenticular nucleus (part of putamen and the globus pallidus) is pale and discoloured, and has a more yellowish tint than natural. The cavity is separated from the floor of the lateral ventricle only by a narrow intervening strip of brain tissue. In the upper and outer part of its side, there being no true wall, is a deposit of cheese-like substance of a yellow colour, which is believed to be of a gummatous nature. This substance is found to extend backwards beneath the floor of the ventricle for a distance of about ½ in. from the first section, and beyond the limit of the cavity; it expands in size, then separating into several foci which lie embedded in the brain tissue. A similar coloured mass is located at the lower extremity of the cavity. In a section on a level with the corpora albicantia there is found a small, oval, isolated cavity formed by softening in the white matter of the centrum ovale, rather above the level of the basal ganglia. It has a vertical length of a grain of wheat, but is a trifle broader. Sections through the right frontal lobe show this to be greatly disorganised. None of this change is visible on the surface of the brain, and does not involve the grey cortex. It is confined entirely to the white matter of the centrum ovale minor. A large irregular patch of softening has been formed in the lower portion, which extends pretty much over the whole extent of the orbital surface, with a vertical width varying from ¼ to ½ in. There is no true cavity, but the brain substance has disappeared in part, leaving a disintegrated and honeycombed appearance. There is a similar patch of smaller size beneath the cortex in the upper part of the lobe, below the superior and middle frontal convolutions and in front of the precentral sulcus.

The lobes of the cerebellum, examined with the same care, appear to be normal to the naked eye, except for a small area of softening in the region of the amygdala on the right side. This affected both the grey and white matter, and seemed to have caused a slight erosion of the surface of the restiform body immediately below the striæ medullares. Sections through the pons and medulla revealed no lesion. In connection with the patch of softening just referred to, it may be mentioned that the right inferior cerebellar artery, which was separated from the vessels about the circle of Willis on removal of the brain, was found to show marked signs of disease. There were a couple of distinct fusiform dilatations of its walls where the coats of the vessel were thickened and opaque. The lowest of these would about correspond to the seat of softening in the cerebellum.

Microscopical Examination, with Observations.—I am indebted to Dr. Watson for kindly preparing some excellent sections from several parts of the brain. These include the prefrontal region near the anterior extremity of the right frontal lobe, a part of the frontal lobe which includes the mesial and orbital cortex together with a part of the softened or gummatous tissue, and a section through the brain between the island of Reil and the lateral ventricle. In addition to these, he also prepared a transverse section of the trunk of the inferior cerebellar artery at the site of one of the thickenings. Sections from all these sites have been stained by the polychrome-blue method to show the cell characters, and by the Hiedenhain hæmatoxylin and eosin method more particularly to show the connective tissue and neuroglia formation.

The artery shows an advanced stage of endarteritis obliterans which at once stamps the case as syphilitic. Only the inner coat is affected. The lumen of the vessel is greatly reduced by a subendothelial proliferation which occurs around the whole circumference, though to an irregular extent. The deeper part (most external) of this tissue has undergone a hyaline degeneration. The elastic layer has disappeared in some places. This is well brought out in the hæmatoxylin-eosin section, where the elastic layer appears as a thin black streak (Plate IV., Fig. 3).

Sections of the frontal region, which include the covering pia mater, exhibit blood vessels with a variable degree of irregular subendothelial proliferation.

The cortex in the frontal region is reduced in width, and shows advanced acute and chronic degenerative changes of all forms of nerve cells, such as one finds in a typical case of general paralysis. The acute changes, Dr. Watson tells me, are the most marked in the polymorphous layer, while the chronic cell degeneration is the most conspicuous in the upper part of the pyramidal layer. There is also excessive neuroglia proliferation throughout the whole of the grey matter, but this is greatest in the molecular layer.

There is a proliferation of small blood vessels and capillaries; their number is much increased, and they exhibit certain abnormal conditions. The larger of these small vessels are dilated, and occasionally one may see a perivascular round-celled infiltration. But most interesting are the changes in the minute vessels. These consist of an endothelial proliferation and abundance of the so-called plasma cells on or composing their walls. Stained with polychrome-blue, endothelial cells take on a pale pink tint; but the plasma cells assume a mauvish-blue colour, and parts of the cell protoplasm, the outline of the nucleus, the nucleolus and chromatic strands are very deeply stained. The exact nature of the latter cells is still in doubt. By some they are believed to be of endothelial origin, while other observers think they are derived from lymphocytes. Dr. Mott at one time supported the first view, but more recently has altered his opinion and believes that "the balance of evidence is in favour of the plasma cells being derived from lymphocytes and not from endothelial cells" (1). For our own part, we believe the balance of evidence is in favour of the view that these cells spring from the lining endothelium of the small vessels and capillaries. But whatever be the origin of these cells, it has been said that they are rarely to be found except in some form of syphilitic brain disease, and more particularly in general paralysis of the insane. Some observers have gone so far as to look upon them as pathognomonic of this disease, in which they are mainly confined to the vessels of the fronto-central regions where in general paralysis the greatest wasting takes place. It may be noted, however, that recent observations do not altogether bear out such a sweeping statement. The existence of these cells in some non-syphilitic diseases has been conclusively proved, though it is true that this peculiar cell proliferation is most readily demonstrated in well-marked cases of dementia paralytica.

The cortex was examined in three places, namely, the extreme anterior frontal region, the mesial and orbital side of the same lobe, and the region of the insula. In all these parts the conditions above described may be seen.

In the grey matter of the corpus striatum and the white substance between this and the island of Reil, there is a more noticeable round cell infiltration around many of the rather larger vessels, which are often considerably dilated. Larger vessels still have a thickening of their muscular coat, and this has often undergone hyaline degeneration. One fair-sized vessel in this region shows an advanced stage of endarteritis obliterans.

Sections including two distinct patches of the honeycomb tissue in the white substance of the right frontal lobe prove that this is not merely softened and disintegrated brain substance but a new formation. There can be no doubt that this is syphilitic—a gummatous tissue which has undergone certain changes. The honeycomb structure is composed of trabeculæ of dense neuroglia, the intervening tissue having almost entirely disintegrated and disappeared. The peripheral portions of these bands of neuroglia are composed only of glia fibrils with an almost complete absence of nuclei; the central parts have much connective tissue nucleation, generally around small vessels which are more or less obliterated. These cells are partly the branching neuroglia cells, and are partly endothelial in origin. The absence of nuclei shows the gradual chronic cicatrisation and necrotic process that is taking place. The latter has already affected the intertrabecular tissue. The destructive process is least advanced at the edge of the slowly spreading growth. Here at the border, the brain tissue is inundated with numerous large branching glia cells, the so-called spider cells. These are evidently the precursors of a more dense fibrillar form of glia which goes to form the trabeculæ above referred to, while the enveloped portions of nerve substance, cut off from their blood supply, gradually undergo necrosis, and, by breaking down, ultimately leave the irregular cavities which produce the honeycomb appearance.

The process is identically the same as that which occurs in syphilitic gumma elsewhere, though there is here a greater tendency to the formation of cavities, owing no doubt to the want of a firmer external support. The ordinary connective-tissue proliferation which occurs in gummata in other organs and tissues is represented in the brain by glia proliferation, and the subsequent dense fibrosis and patchy necrosis which subsequently replaces the cellular element finds its counterpart in the more delicate fibrillar tissue of the neuroglia.

There is no reason to suppose that all the other areas referred to as softenings differed in any respects from those in the frontal lobe, for all, whether large or small, had the same naked-eye appearances. The larger the areas, however, the more extensive was the breaking down into cavity formation, as would naturally be expected in older and larger gummata.

It has been said that gummata of the brain are almost invariably situated superficially and connected with the pial covering or the processes of pia mater prolonged into the sulci; that they are, more often than not, closely connected with one of the larger branches of the cerebral arteries. This is the view expressed by Gowers both in his "Manual of Diseases of the Nervous System" (²) and in his "Lettsomian Lectures" for 1890 (³). He says that almost the only place where they occur, strictly speaking, within the brain, is in the thalamic region, and there they are ingrowths from the side of the crus. W. A. Turner suggests much the same in his article on "Intracranial Syphilis" in Allbutt's "System of Medicine" (⁴). In the same volume Bullock (⁵) refers to Heubner as having found syphiloma in the interior of the brain only three times in forty-five cases.

My own previous experience as regards gummata of the brain was limited to those that have been superficially situated. Definite localised tumours, though embedded in the brain, were attached to the pia mater. I have recorded a good instance of this kind in the *Pathological Transactions* (⁶). Such localised tumours of syphilitic origin are very rarely found in the brain of persons who die insane, notwithstanding the fact that so many persons who die in lunatic asylums have a history of syphilitic infection. Areas of softening, on the other hand, are fairly common in the brains of lunatics, but are rarely examined microscopically. It is possible that some of these might prove to be breaking-down gummatous tissue.

From the microscopical characters of the tissue forming the breaking-down areas of softening in the present case, I have no doubt myself of its syphilitic nature. I attribute the difference in structure between the deposits in this case and that of a usually described gumma of the brain, to the fact that these were not directly connected with the pia or outer sheath of a larger vessel, and therefore the ordinary connective tissue is wanting and is represented by glia tissue. All the new tissue formations here have an irregular invading character without any distinct limitation or circumscribed tumour formation. The deposits are certainly not tubercle, nor are they gliomata, or any recognised form of malignant growth. They no doubt start from the smaller blood vessels within the brain substance, their connection with which is seen to be very intimate.

This hypothesis receives strong support from the microscopical appearances to be seen in parts of the brain where no softening or growth is visible to the naked eye. Around the vessels whose walls have undergone degeneration is a network structure formed by connective tissue or neuroglia cells. There can be no doubt that the large areas of disintegration commenced in a similar way. The surrounding brain tissue is altered from the normal. There is an unnatural fine fibrillary network pervading the whole structure, without, however, the actual disappearance of ground substance. The glia cells have assumed shapes and sizes which are not usually found in the normal white substance of the brain, but which can readily explain the forms and varieties of cells to be found in the disintegrated areas of brain tissue.

Heubner recognises two characteristic forms of syphilitic growth in the brain—(1) A localised, firm, dry deposit, which on section is often found caseous and broken down in the centre, with a reddish and translucent periphery, and in which there is often much connective tissue developed. (2) An ill-defined, comparatively soft, moist, greyish or greyish-red mass, which on section exudes a scanty juice. The first of these is the variety that is generally recognised as gumma of the brain, and which occurs mostly at the base in the region of the larger vessels. The second form is that which occurs in the brain substance, and is generally believed to be very rare, but, as I have already remarked, it may be much more common than is generally supposed. The deposits I am now describing are evidently of this nature. As pointed out by Mills ([7]), gummata that develop in the substance of the brain originate from the vessels. This statement is borne out by the case now recorded.

General Remarks.—There are many features of more than usual interest presented by this case. The evidence of syphilis is undeniable. The mental disease of the patient during life presented the typical features of general paralysis of the insane, and the fatal malady ran a characteristic course, yet the brain presented an appearance more in accordance with gross syphilitic brain disease. The condition of the arteries, both large and small, stamps the disease as syphilitic even had a history been wanted, but this form of degeneration and subendothelial growth may occur in both diseases that have been named. It is, however, not usual to find areas of softening or gummatous tissue in the brain of general paralytics, at least to any extent. In this case they were numerous, and in places extending over a large area. Yet apart from these the histological structure of the brain is indistinguishable from that in dementia paralytica. There is the same form of cell degeneration, neuroglia proliferation, and changes in the small blood vessels. I have already commented at some length on the structure of the deposits that occur so numerously throughout both cerebral hemispheres, and have expressed the opinion that they are of gummatous nature, that is to say, syphilitic growths.

But the presence of gross syphilitic lesions in the brain, although rare in such cases, certainly cannot be said to nullify the clinical diagnosis of general paralysis. If general paralysis is a disease intimately associated with syphilis,—a purely syphilitic form of brain disease of a finer order, as some would have us believe,—the presence in the brain of a grosser form of syphilitic lesion is not to be wondered at. The strange thing, to my mind, is rather that gummatous deposits do not occur with greater frequency in this form of mental disease. Instead of annulling general paralysis, such a case as this I consider tends to strengthen the syphilitic theory of general paralysis.

Many writers on general paralysis acknowledge that in a certain proportion of the cases of that disease, considerable difficulty may be experienced in differentiating from cerebral syphilis with a gross lesion. The discussion usually closes, however, with the statement that the discovery after death of a gummatous deposit clears up the diagnosis. On this point it is worth noting what Professor Ziehen of Berlin has to say. After writing of the differential diagnosis of cerebral syphilis and general paralysis, he remarks:

"It must be borne in mind that upon a circumscribed syphilitic focal affection (cerebral syphilis strictly so-called) a diffuse cortical alteration of the nature of dementia paralytica not infrequently supervenes; accordingly one observes clinically that to the uncomplicated symptoms of a syphiloma or gummatous meningitis there are added later the typical symptoms of a dementia paralytica: the brain syphilis has gone over into dementia paralytica. Finally, it must be taken into account that even anatomically from the beginning there exist transition forms between the diffuse paralytic cortical affection and the circumscribed gummatous infiltrations. Thus, even from the entire clinical course and post-mortem findings we shall not be able to make an absolutely sharp diagnosis in all cases" ([8]).

It is evident from the foregoing that Ziehen not merely recognises the difficulty of diagnosis between the two diseases, but that he goes further and states definitely that both gross syphilitic brain disease and general paralysis may coexist at the same time in the same individual. This is the view that I have ventured to assert, and it is satisfactory to find that so able an authority on the Continent holds views on the subject that may be regarded as identical with my own.

A case having many points of great similarity to the present one has lately been recorded by Dr. Emma W. Mooers ([9]). The paper is illustrated by diagrams showing the site of numerous focal lesions throughout the cerebral hemispheres. The sections of the brain seem to be studded over by necrotic areas, some of which were of considerable extent; for the most part they occur in the white matter, but some involve the cortex. The minute structure of these is thus described: "Thin sections from the various focal lesions were examined, and all show essentially the same histological structure, namely, masses of very cellular tissue enclosing foci of necrotic material. The cells making up the main masses consist of the various cells which may be found in granulation tissue and in lymphoid tissue. Interspersed among the cells are a large number of capillary blood vessels. The necrotic areas are generally seen to be bordered by elongated cells with vesicular nuclei and indefinite protoplasm (epithelioid cells). Giant cells are occasionally found. In brief, the focal lesions have the general appearance of masses of granulation tissue undergoing necrosis, and have a structure which might be that of a gumma or a neoplasm due to tuberculosis, as we know of no purely histological criteria for distinguishing with certainty between the two diseases."

After pointing out the greater probability of these being syphilitic granulomatous new growths, the writer proceeds: "In the brain tissue adjacent to these focal lesions there is a well-marked increase in the neuroglia cells, some of which attain huge size. There is a replacement of brain substance in some regions by a spongy-looking tissue consisting of heavy bands of fibres, and, not numerous, but only loosely distributed among these, huge glia cells."

The patient, a man, æt. 40, was taken to the McLean Hospital because he presented certain symptoms which were thought to be evidence of general paralysis. Although the case is published as one of syphilis of the nervous system, the clinical history that is given is typical of general paralysis. He had a convulsive seizure about seven months before death, followed by other slight attacks, and the physical signs became more and more suggestive of progressive dementia paralytica. In addition to the gross lesions in the brain, there were marked lesions of a syphilitic nature found in the cord and its meninges.

Much difference of opinion still prevails, especially in this country, as to the relationship that exists between syphilis and aneurysmal disease of arteries. We see this strikingly brought out in Clifford Allbutt's "System of Medicine," published in 1900. In vol. vi. we find Dr. Mott expressing advanced views on the subject in his article on "Arterial Degenerations and Diseases." "I recall," he says, "very few cases of aneurysm of the aorta in men from whom I had not been able to obtain or detect a specific history. Likewise, a large proportion of cases of aneurysm of the cerebral arteries, and of the large vessels of the body, are of syphilitic origin" (p. 305). In the very next article on "Aneurysm of the Aorta," the subject of syphilis receives but scant notice from Dr. Gairdner. "Syphilis plays an important part in degenerative changes, which, however, are rather obstructive than aneurysmal" (p. 362). A remark made by Professor Drummond to the effect that he had found it a good practical rule not to diagnose aneurysm in a doubtful case, in the absence of syphilis, is labelled an "astonishing doctrine."

But the general question, whether or not syphilis is a common cause of aneurysmal dilatation of an artery, need not be now discussed; that syphilitic arteritis is sometimes the cause of aneurysmal dilatation can scarcely be said to admit of doubt. The present case is an instructive case from this point of view. Here we have a definite syphilitic disease of the arteries in a man not subject to any special strain on the vascular system, who developed numerous aneurysms,—dilatations both on the thick-walled vessels of the neck and the thin-walled vessels in the cranium. The syphilitic disease of the arteries is unmistakable. The condition of the intima of the aorta is characteristic; it is very different to the ordinary atheroma. The character of the disease of the arteries of the brain, both external and internal, cannot be mistaken. There is no other disease which causes anything like this form of endarteritis obliterans. We may, I think, consider that syphilis was without any doubt the cause of the aneurysmal dilatations in this case.

Intracranial aneurysms have rarely in this country been attributed to syphilitic disease of the arteries. We could probably count the number of recorded cases on the fingers of one hand. Some writers on the Continent, however, are much more generous in the number of such aneurysms that they attribute to syphilitic disease. Gerhardt, in a lecture delivered in 1887 on diseases of the cerebral arteries (10), expressed the opinion that syphilis was a powerful factor in the causation of aneurysm of these vessels. In the present case there can be little doubt that the numerons dilatations on the large arteries at the base of the brain were due to local disease of the vessel walls. These vessels are evidently entirely obstructed in many places, so that no blood could pass. This is so of the basilar and the branches of the right middle cerebral. It was in the right cerebral hemisphere that the most extensive areas of softening were found, and the plugging of the branches of the middle cerebral artery of that side helps to explain the disintegrated condition of the white substance. These aneurysmal dilatations of the brain arteries were probably of quite recent origin; as aneurysms they produced no symptoms; they grew possibly with the accumulation and adhesion of clot and fibrin to the irregular lining of the diseased vessels.

Spontaneous aneurysm of the carotid artery does not rank among the most common of external aneurysms, but it is the most frequent of that class in the female. This is attributed to the fact that an aneurysm of this artery is seldom the result of violence or external strain, but generally arises from disease of the coats of the vessel. It also occurs at a relatively young age. These facts have been used as arguments in favour of syphilis as a factor in the causation of aneurysm. "The right carotid is much more commonly affected than the left, and the upper portion of the vessel than the lower; indeed, the bifurcation is the most common seat of aneurysmal dilatation" (11). In this situation they are usually of slow growth, and may sometimes exist for a considerable number of years without giving rise to any special inconvenience. They may, however, be of rapid growth, for Erichsen has seen a case of this kind attain the size of a small orange in a few weeks.

The occurrence of more than one aneurysm on the larger arterial trunks of the body is not common; two symmetrically situated aneurysms on the carotid arteries I have not seen described, and I do not think there is any specimen of this kind to be found in any pathological museum in London. The majority of recorded cases of multiple aneurysmal disease will be found, I believe, to be associated with ulcerative endocarditis or other acute infective processes, and are attributable to embolic origin. Many of the most interesting of these occurred in young persons.

In the present case the aneurysms do not appear to have been recognised during life, and it is impossible to say how long it had taken for them to acquire their size.

Aneurysm of the coronary arteries of the heart is certainly to be reckoned among the rarer pathological lesions. The condition is referred to in few text-books, in few even of the larger Systems of Medicine that have made their appearance in recent years. Comparatively few isolated cases appear to be recorded in medical literature. In comparison to this lesion, aneurysms of the heart and of the aorta in the region of the sinuses of Valsalva are fairly common, yet cases of both these conditions are constantly being recorded. This fact alone is sufficient, to my mind, to mark aneurysm of the coronary arteries as extremely rare, apart from the fact that with a large personal experience I have not previously seen a case of localised dilatation of these arteries such as would be defined as aneurysmal. Another condition, too, which has received a fair amount of attention, is narrowing or obstruction at, or near, the orifices of these arteries through degenerative conditions of their walls,—a lesion that can scarcely be looked upon as one of great rarity.

A search through that fruitful source of information, the *Trans. Path. Soc. London*, discloses the fact that only five cases of aneurysm of the coronary arteries appear to have been brought before the Society, and four of these were during the earlier years of its existence.

When, in January 1848, Peacock showed a specimen at the Pathological Society, he remarked "that the specimen exhibited was almost unique, no allusion being made to the occurrence of aneurysm of the coronary arteries by any of the systematic writers on pathological anatomy, or on diseases of the heart." He could only find the record of three cases, in each of which death resulted from rupture of the aneurysmal sac into the cavity of the pericardium, combined in one case "with rupture of the walls of the left ventricle, ascribed to the aneurysm having first burst into that cavity, and the rupture so formed being subsequently extended to the pericardium."

Subsequent cases have been recorded by Bristowe, Ward, and Crisp, and much more recently by Jackson Clarke. Crisp was able to collect twelve cases of aneurysm of the coronary artery that he had met with in various museums and in the works of different authors, but he admits that only a few foreign journals were consulted. In commenting on these cases, Crisp observes: "It will be seen that, excluding my first case, which can scarcely be called one of genuine aneurysm, all the eleven subjects of this lesion were males, and that in seven examples the aneurysm ruptured into the pericardium. As might be expected, in no instance was the presence of this aneurysm suspected during life." Without attempting to search further into medical literature,[1] we have here, I think, sufficient evidence that aneurysms of the coronary arteries are rare; that when they do occur they may be solitary, but almost as frequently they are multiple; that more often than not their rupture is the immediate cause of death; and that the origin of these aneurysms is usually to be attributed either to embolic plugging of the vessel or to syphilitic disease of its wall. Although the latter disease is not stated to have been present in either of the above cases, there is little doubt in my own mind that it was present in more than one instance.

Since the foregoing was written, I find that the subject of aneurysm of the coronary arteries of the heart has been dealt with far more fully than previously by Wardrop Griffith in a paper brought before the Leeds and West Riding Medico-Chirurgical Society, and printed in the *Brit. Med. Journ.*, London (12). Having noted the fact that aneurysmal dilatation of these arteries is "so uncommon," he proceeds to record two cases, both of which would seem to be of embolic origin, secondary to acute infective endocarditis.

A considerable part of Griffith's paper is taken up with a general discussion on embolism and its relation to aneurysm of the smaller arteries. He has, however, been at considerable pains to look up the literature bearing on aneurysm of the coronary arteries. He discards several of the examples mentioned in the primary references as probably not coming within the category of true aneurysms of these arteries. Excluding the doubtful cases, there remain, with his own, twenty-four examples published between the years 1812 and 1900 (13). In six of these, few particulars are given; in exactly half of the remaining eighteen, death occurred from rupture into the pericardial sac.

"In eleven instances the aneurysm was solitary, occurring four times on the right and four times on the left artery, while in three instances its situation is not noted. In the seven instances in which the aneurysms were multiple, they varied in number from three up to twelve. In only two instances is it noted that the aneuryism was in the auricular wall; in all the others it appears to have been on the main stem of the artery, or on the ventricular part of the heart, and usually on the latter. Some writers who mention the site state that the aneurysms were at or close to the points of origin of branches, a fact of some importance in relation to causation. In size they have varied from that of a chestnut to that of a small pea. In fourteen instances the affection occurred in the male sex, and in four in the female. Of the fourteen instances in which the age is noted only five were above the age of 26, and the ages varied from 5 to 77."

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[1] It may be noted, however, that reference to the indices of the *Brit. Med. Journ.*, London, and its "Epitome of Current Medical Literature," for the last ten years, failed to reveal a single case beyond those contained in Griffith's paper.

In discussing the causation of these aneurysms, Griffith refers only to the embolic theory as applied to a certain proportion of the cases. He is able to say that in only four of the eighteen cases could this mode of origin be regarded as certain. These four cases included his own two cases and those recorded by Bougon and Ogle. Of Bougon's case, however, he notes that "the patient was an old man, and the coronary arteries were studded with osseous plates." Ogle in his paper in the *St. George's Hosp. Rep.* for 1867, London, was the first writer who definitely attributed coronary aneurysm to embolism. His former case, published in 1864, may have illustrated the very commencement of an aneurysm due to a similar cause. Embolism is looked upon as highly probable in Clarke's case, and also in Bristowe's case, for although in the latter case the cardiac valves were said to have been healthy, yet the internal organs contained embolic infarcts. The cases of Peacock, Heuse, Crisp, Peste, Gee (æt. 7), Malet and Evans (æt. 5), the Bartholomew's Hospital case (æt. 11), and that of St. Thomas's Hospital (æt. 22), are also looked upon by this author as probably due to embolism; but it seems to me that the attempt to class some of these under an allied etiology is made on very weak and insufficient evidence. In the cases of Markoe, Wood, Hedland, and Merat, Griffith acknowledges that he can find no facts on which to form an opinion.

The possibility of syphilitic disease of the artery as a cause of the affection does not appear to have entered into the calculations of this writer, for no reference whatever is made to the subject. This is the greater pity, for it is evident that much time has been expended on looking over the original records.

The author concludes his remarks by saying: "I have intentionally refrained from any attempt to discuss the clinical phenomena of coronary aneurysm. The symptoms are, with the exception of those caused by rupture, chiefly those of the associated condition. The affection might be guessed at, but hardly, I think, diagnosed, and the two chief points I desire to emphasise are, the rarity of its occurrence, and the probability of its sharing the peculiarity of aneurysms on small vessels elsewhere, in being embolic in origin."

As already observed, there is little or nothing said on coronary aneurysms in medical works of the present day; this circumstance, in conjunction with the views expressed by Griffith, who would

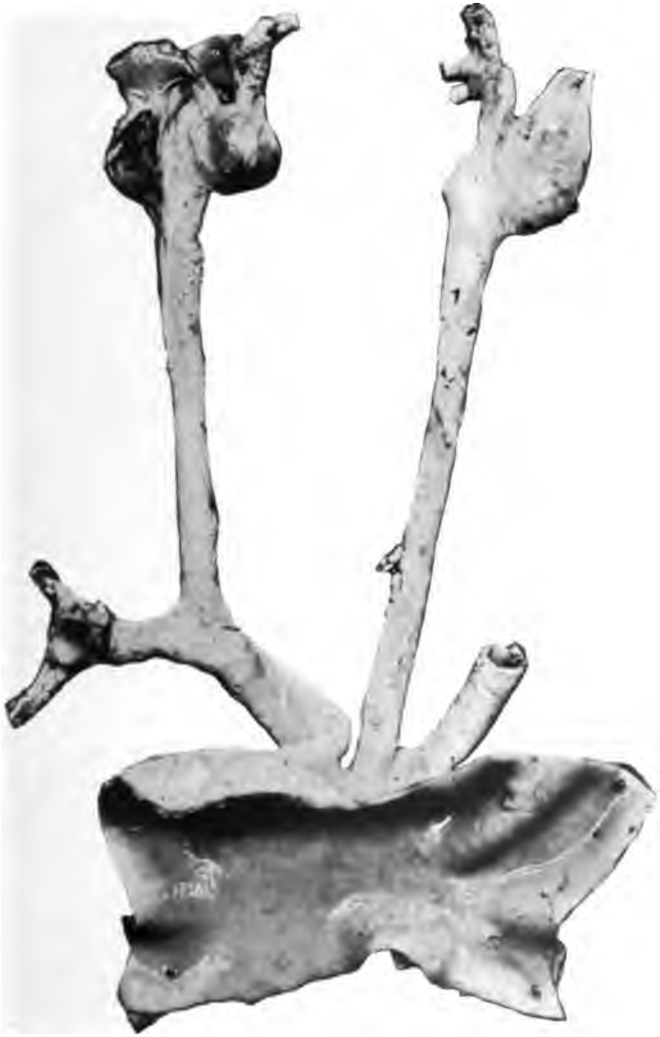

Fig. 1.—The arch of the aorta with the two carotid arteries, showing an aneurysm at the bifurcation of both of the latter vessels, involving the origin of the internal carotid arteries.

From a Photograph.

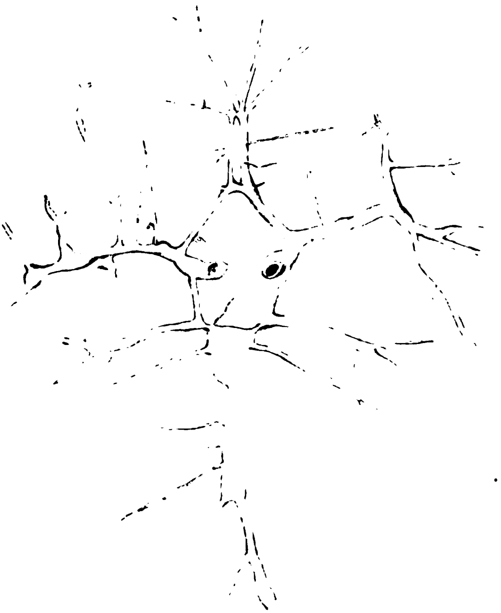

FIG. 2.—The circle of Willis and the larger branches of the cerebral arteries. Nat. size.

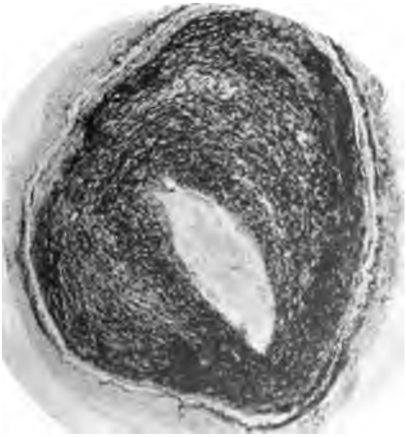

FIG. 3.—Transverse section of the right inferior cerebellar artery, showing great sub-endothelial overgrowth and imperfect elastic layer. Microphotograph.

seem to assign all to an acute infective embolic origin, must be my excuse for entering somewhat fully on the subject in these pages.

Pepper's "System of Medicine" is to some extent an exception to both these remarks, for Cutler (14) in a short section on this condition, while referring to the rare occurrence of aneurysm of the coronary arteries, says the most common cause of the affection is chronic endarteritis, where, through disease of the intima, the resistance of the blood pressure is diminished; while embolism is another, though rarer, cause. He further notes that aneurysms on this vessel are rarely larger than a pea, and that the termination is usually rupture with fatal hæmorrhage, in far the majority of cases into the pericardium. "In almost all the cases I have found recorded there were no symptoms till rupture of the sac occurred, giving rise to death from hæmorrhage. Then those symptoms which might be expected occurred, namely, great præcordial pain, dyspnœa, suffocation, tumultuous heart, irregular and intermittent pulse, and sudden death." Syphilitic arteritis of the coronary arteries more frequently manifests itself by a constriction of the lumen of the artery than by a dilatation, and it is not at all rare to find a considerable obstruction to the orifice of these vessels when syphilitic aortitis is present. That condition more often than not seems to commence about the sinuses of Valsalva.

Thrombosis of the coronary arteries is probably a good deal more frequent than is commonly supposed, but it is generally recognised that embolism of these arteries is extremely rare. Welch (15) points out that while arterial thrombosis may be caused by some local injury or disease of the arterial wall or by the lodgment of an embolus, that of the coronary arteries is in the great majority of cases an incident of angio-sclerosis of the heart. "It may also result from acute or chronic endaortitis near the orifices of these arteries, and possibly from acute inflammation of the coronary arteries. Thrombotic vegetations, springing from the aortic valves, have been known to block the mouth of one of the coronary arteries." The anastomoses that occur between the larger trunks do not usually suffice for the nutrition of the heart after rapid occlusion either of the main trunks or of intramuscular branches. Mott (16) observes that syphilitic arteritis of these arteries may be followed by thrombosis. This may cause necrotic patches in the myocardium. "The degenerated tissue may yield, and an aneurysm of the heart result; but more commonly there is a gradual process of coagulum necrosis of the muscles and fibrous substitution, thus accounting for many cases of the so-called fibroid heart of syphilitic origin." Cases of almost complete obstruction are generally rapidly fatal.

A heart from a case of angina pectoris was shown at the Pathological Society by Parkes Weber (17), in which the channel of the right coronary artery was obliterated by organised thrombus at about 2½ in. from its orifice for a space of about 1 in. The lumen of the left coronary artery was also much narrowed by atheromatous changes at about 2 in. from the orifice. The heart was in a state of extreme fibroid degeneration. The patient had pulmonary tuberculosis, and died during an attack of angina at the age of 56. No mention is made of syphilis. Barth (18) has reported the case of a young man of 30, who died suddenly when in apparently the best of health. The orifice of the right coronary artery was found blocked by a thrombus attached to a small atheromatous patch in the aortic intima. This was the only patch of atheroma that could be found in what otherwise seemed a perfectly healthy body. Sudden death has also been recorded where an embolus has lodged in the main trunk of one of these arteries. Such a case is recorded by Cyril Ogle (19). A youth, æt. 17, suddenly became very distressed for breath, and cyanosed, and died within ten minutes of the onset of the symptoms. Here, one of the main divisions of the left coronary was firmly plugged by an embolism derived from a polypoid mass in the left ventricle.

Death may, however, occur with equal suddenness when the obstruction to the flow of blood through these arteries is due to other causes. Thus in a case recorded by Samuel West (20), a man of about 40 died suddenly while in hospital for heart disease. In this case the mouth of the left coronary artery was completely obliterated by a calcareous plate, though the vessel was pervious and of normal size beyond the obstruction. The right coronary artery was large, but its mouth considerably narrowed by atheroma.

There are, however, plenty of other cases on record where the main trunk of one of the coronary arteries has been plugged without the occurrence of sudden death. In such cases the patients have gradually sunk from cardiac failure in the course of a few days after the obstruction. The symptoms resulting from coronary thrombosis are indistinguishable from those of advanced fibroid disease of the heart, and may occur in cases of sclerosis of the coronary arteries without thrombosis, so that it is not possible to make a diagnosis of thrombotic occlusion. It is possible that the latter condition was the immediate cause of death in the case which is the subject of this paper.

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14. Pepper.—"System of Medicine," 1885, vol. iii. p. 830. 15. Allbutt.—"System of Medicine," vol. vi. p. 208. 16. Allbutt.—"System of Medicine," vol. vi. p. 314. 17. *Trans. Path. Soc. London*, 1896, p. 14. 18. *Deutsche med. Wchnschr.*, 1896, p. 269. 19. *Trans. Path. Soc. London*, 1896, vol. xlvii. p. 29. 20. *Idem*, 1883, vol. xxxiv. p. 66.

Note.—The following are the twenty-four cases of true coronary aneurysm given by Griffith, arranged in chronological order. The six marked (*) are excluded from that writer's summary, owing to want of particulars :—

Bougon.—*Bibliothèque Méd.*, 1812, p. 37. *Wiegaud.—*Med. Convers. Bl. Hildburgh*, 1830, p. 217. Peste.—*Arch. gén. de méd.*, Paris, 1843, vol. ii. p. 274. Merat.—*Dict. des Sciences méd.*, 1849, vol. v. p. 484. Hedland.—"Otto's Compendium of Patholog. Anatomy," 1849. Peacock.—*Trans. Path. Soc. London*, 1849, vol. i. p. 227; *Monthly Journ. Med. Sc.*, 1849, vol. ix. p. 592. Heuse.—*Presse méd. belge*, Bruxelles, 1856. *Finnell.—*New York Med. Journ.*, N.S., 1856, vol. xvi. p. 82. Bristowe.—*Trans. Path. Soc. London*, 1856, vol. vii. p. 98. Wood.—Quoted by Ogle, 1860. Markoe.—*Idem.* *Shrady.—*New York Med. Press*, N.S., 1860, vol. iii. p. 225; *New York Med. Journ.*, Ser. 3, 1860, vol. viii. p. 384. *Chadwick (2 cases).—Referred to by Ogle, 1867. Ogle.—*St. George's Hosp. Rep.*, London, 1867, vol. ii. p. 285. *Buchner.—"Aneurysma der Arteria Coronaria Cordis Sinistra," Amsterdam, 1867.—Bart.'s Hosp.—Referred to by Crisp, 1871. Bart.'s Hosp. and Gee.—*St. Barth. Hosp. Rep.*, London, 1871, vol. vii. p. 148. Crisp.—*Trans. Path. Soc. London*, 1871, vol. xxii. pp. 106–111, with table. St. Thomas's Hosp.—Powell in "Reynold's System," 1879, vol. v. p. 132. Malet and Evans.—*Lancet*, London, 1887, vol. ii. p. 67. Clarke.—*Trans. Path. Soc. London*, 1896, vol. xlvii. p. 24. Griffith (2 cases).

A CASE OF RUPTURE OF HERNIATED BOWEL BY SUDDEN CONTRACTION OF ABDOMINAL MUSCLES.

By Alexander Miles, F.R.C.S., *Surgeon to Leith Hospital; Assistant-Surgeon, Royal Infirmary, Edinburgh.*

The following case illustrates one of the rarer risks incident to an old-standing inguinal hernia :—

Case.—The patient was a man, æt. 72, hale and hearty for his years, and still in active employment as a engineer in one of the engineering works in Leith. For twenty years he had suffered from a double inguinal hernia, larger on the left side than on the right. He had, for most of this time, worn a double spiral truss; and although this did not at all times control the hernia, it afforded him considerable comfort, and enabled him to continue at work. For some months before I saw him the rupture had been more troublesome, coming down past the truss more frequently, and, when down, it was painful. Sometimes on coming home after a hard day's work, even if the hernia was not down, he had a vague pain in the lower part of his abdomen, which, however, disappeared if he lay on his back for a time. On no occasion had there been any difficulty in reducing the swelling, in fact it usually disappeared spontaneously as soon as he lay down; if not, it could easily be returned by making slight pressure over it. There had never been any threatening of strangulation, nor any interference with the action of the bowels. So far as could be gathered, it was intestine alone that came down.

On the morning of the 18th November 1903 he went to work as usual, and, after working all forenoon, took a hearty dinner between 1 and 2 o'clock, and returned to the engine-room perfectly well. On resuming his work he required a heavy piece of piping which was lying on the far-away side of a broad bench, and while stretching across the bench and lifting this, he was suddenly seized with intense pain in the abdomen. He fell on the floor, and lay there for some minutes in intense agony, pale and faint. He felt very sick, but did not vomit. His fellow-workmen, recognising that he was seriously ill, conveyed him at once to Leith Hospital, where he arrived about half an hour after the onset of the pain. He was then in a condition of collapse, the skin pale, cold, and damp, the temperature 96° Fahr., and the pulse about 76. Soon after admission he vomited the contents of the stomach, consisting of the food he had taken for dinner; there was no blood in the vomited matter. He complained of violent pain in the abdomen, particularly around the region of the umbilicus, and radiating from the large left inguinal hernia, which at the time was down in the scrotum. After the patient had been put to bed, the house surgeon (Dr. R. W. Johnstone) examined the swelling in the scrotum in the belief that he had to do with a strangulated hernia, and was astonished that, as soon as he handled it, it slipped back into the abdomen with a gurgle, and completely disappeared. Although the patient at once expressed himself as relieved, the ease with which the hernia had been returned, contrasted with the severity of the symptoms at the time of its descent and while it was down, made the house surgeon doubt if his diagnosis had been correct, and he at once communicated with me.

Two hours later I saw the patient; he was not then suffering much pain, but the abdominal muscles were rigid, and the wall did not move with respiration. As the pulse-rate had increased by 20 beats and the temperature had risen a degree, and as the patient looked more seriously ill than one would have expected after the reduction of a strangulated hernia, it was decided to open the abdomen in view of the possibility of the bowel being ruptured.

The usual oblique incision was made in the line of the inguinal canal, exposing a thick-walled, empty hernial sac. On passing the finger into the peritoneal cavity, a quantity of glairy peritoneal fluid escaped. The inguinal canal was then opened up sufficiently to admit of the peritoneal cavity being explored. The first loop of bowel within reach, apparently a coil of the lower jejunum, was withdrawn, and for a distance of about a foot and a half was found to be matted in a series of small folds held together by firm fibrous adhesions. About the middle of this segment the bowel was found completely torn across in such a way that there were four open ends of intestine (Fig. 2). About 2 feet of the bowel were resected, and an end-to-end suture performed. The abdomen was washed out, the peritoneal cavity drained by glass tubes containing iodoform-worsted wicks, the wound closed, and the patient placed in the Fowler position.

On examining the segment resected, it was evident that three short loops of bowel had been folded fan-wise, and their adjacent free borders become adherent (Fig. 1); and that on the mesenteric border, where the lateral loops met the central one, the bowel had been completely torn across (Fig. 2), thus presenting the four open ends, and isolating the central loop in a U-shaped bend.

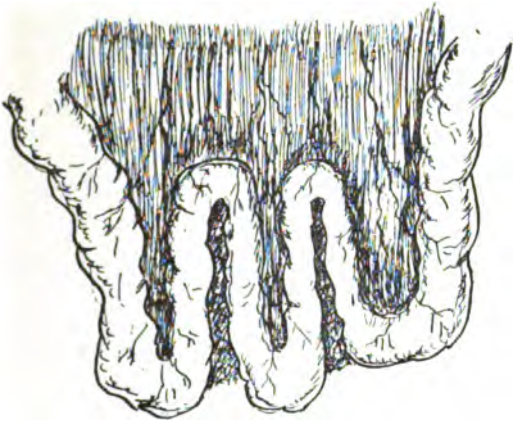

FIG. 1.—Diagram to illustrate fan-like folding of intestine in hernia.

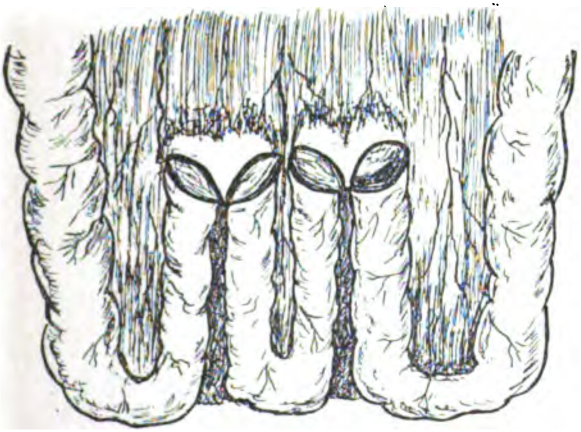

FIG 2.—Diagram showing torn ends of intestine.

The patient rallied for a time after the operation, and next morning appeared to be doing well. Later in the day, however, signs of peritonitis developed, and he died twenty-eight hours after operation.

On post-mortem examination, it was found that there was a generalised purulent peritonitis, most marked in the region of the rupture. The junction of the intestine was water-tight.

REMARKS.—The interest of this case lies chiefly in the mechanism by which the lesion was produced. Doubtless the folding and adherence of the adjacent loops of intestine were associated with the old-standing hernia, subjected to intermittent pressure by an imperfectly fitting truss. It seems probable that in stretching himself across his bench the patient forced the fan-shaped knuckle of bowel into the sac, and that the muscular effort involved in attempting to lift a heavy object at arm's-length while in this attitude determined the tear. At the moment the lower attachments of the abdominal muscles in the vicinity of the inguinal canal would become the fixed points, against which the muscles of the back would act in straightening the body. The loop of bowel engaged in the sac would thus be suddenly and tightly constricted, and it is not difficult to believe that it might even be torn across. After the rupture took place, the torn loops and the other coils of intestine that habitually became herniated doubtless passed into the sac, but not before the escape of bowel contents had contaminated the peritoneal cavity. As no force was necessary to reduce the hernia, and none was employed, it is certain that the rupture was not produced when the bowel was returned. Had it been so, it is highly probable that, in place of the patient being relieved by the reduction, his pain would have been increased. Further, the acuteness of onset and the severity of the initial symptoms were more suggestive of an intestinal perforation than of the onset of strangulation in an old-standing hernia; nor did the bowel away from the seat of the tear or the mesentery show any evidence of having been strangulated.

At the risk of appearing to be wise after the event, it may be suggested that if the patient had been operated upon while the hernia was still in the scrotum, the torn ends of bowel would have been found in the sac, and the contamination of the peritoneal cavity resulting from their being returned might thus have been avoided. While it would be straining the point to use this case as an argument against the use of taxis in strangulated hernia, it may fairly be said that it furnishes an illustration of one of the possible risks attending this procedure.

"THOMAS SYDENHAM, THE ENGLISH HIPPOCRATES."[1]

By W. H. COUPLAND, L.R.C.P.Edin., *Senior Assistant Medical Officer, The Royal Albert Asylum for Idiots, Lancaster.*

GENTLEMEN,—In the paper that I had the honour to read before this Club, entitled "Sir Thomas Browne,"[2] I incidentally mentioned and quoted an anecdote concerning one of his contemporaries, Thomas Sydenham, the greatest physician of the seventeenth century, and one who has been called the *English Hippocrates.* Of him I purpose to speak to-night, and in the course of my remarks I shall mention others of his time who influenced him either by their friendship or by their position in the intellectual world of that day.

Many particulars must of necessity be omitted, and I can only attempt a mere sketch of his career, leaving yourselves, if your interest is aroused, to refer to some of the material I have used and which is before me; and among this I draw your attention to the editions of the works of Sydenham issued by the Sydenham Society; to the "Dictionary of National Biography"; to the "Life of Sydenham," written by Dr. Samuel Johnson; to "Eminent Doctors," by Mr. Bettany; and especially to the volume in the "Masters of Medicine" Series, written by Dr. Payne—who also wrote the article in the "Dictionary of National Biography,"—a book to which I am indebted for much accurate information, many points in the career of our hero being wrapped in obscurity. Lastly, to that delightful essay, by Dr. John Brown, to be found in "Horæ Subsecivæ," in which both Sydenham and his friend Locke, the physician-philosopher, are so very racily dealt with. My paper is, I will at once confess, but a mass of extracts, and has been compiled only by the aid of *scissors and paste,* that common factor in the etiology of literary work, for, like Molière, *Je prends mon bien où je le trouve.*

Thomas Sydenham, "the man of many doubts," was born at Windford Eagle, in Dorsetshire, just before September 1624, his father William being a man of means. His early life is almost unknown, but the age of eighteen finds him entered as a commoner at Magdalen Hall, then a great centre of Oxford Puritanism. It seems probable that he did not stay long there, but that he entered the service of the Parliament, Dr. Johnson's statement that it was the king's side he took being incorrect, for we know that his family was much connected with Cromwell, one of his brothers being the Governor of the Isle of Wight; in some way unknown Sydenham's mother was killed during the civil war in the year 1644. His stay in the army cannot have been long, for in 1648 he took the degree of Bachelor of Physic at Oxford, very little preparation for which sufficed in those elastic days, when curricula and degrees could be easily attained by influence, either active or passive. On 3rd October of the same year he was made a Fellow of All Souls' College in the place of one of the expelled Royalists, and after staying at the university for some little time, according to Desault in his "Dissertation on Consumptions," he took a journey to the celebrated medical school at Montpellier in France.

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[1] An address delivered at the annual meeting of the Lancaster Medical Book Club, January 1907.

[2] *Edin. Med. Journ.,* April 1905.

It seems that he took up the study of medicine owing to the influence and advice of a Dr. Th. Coxe, for in his "Medical Observations," third edition, Sydenham wrote:

> "It is now the thirtieth year since the time when, being on my way to London, in order to go from thence a second time to Oxford (from which the misfortunes of the first war had kept me for some years), I had the good fortune to fall in with the most learned and honourable Dr. Thomas Coxe, who was at that time attending my brother during an illness, and then, as he has been up to the present time, practising medicine with great distinction. He, with his well-known kindness and courtesy, asked me what profession I was preparing to enter, now that I was resuming my interrupted studies, and was come to man's estate. I had at that time no fixed plans, and was not even dreaming of the profession of medicine; but moved by the recommendation and influence of so great a man, and in some way, I suppose, by my own destiny, I applied myself seriously to that pursuit. And certainly, if my efforts have turned out to be of the least public utility, the credit must be thankfully referred to him who was the patron and promoter of my early studies. After spending a few years in the university, I returned to London and entered on the practice of medicine."

It is probable, although the point had not been settled in Dr. Payne's mind when he wrote his life, that Sydenham was presented with the M.A. degree; however, by command of the Earl of Pembroke, he was inducted to the Bachelorship of Medicine on 14th April 1648, and it is apparent that this installation was hurried on to allow of him being made a Fellow of All Souls', as has been previously mentioned. Unlike practitioners of to-day, he obtained his qualification at the beginning instead of at the end of his student's course, but we shall agree with the apt remark of Dr. Payne, who says, "If we consider the incalculable gain to the science of medicine involved in making Sydenham a doctor, we must admit that seldom has the blind Goddess of Patronage dispensed her favours with a happier hand." The year 1647 was a stirring one for the University of Oxford, for the Parliament then appointed Visitors, of necessity advanced Puritans, to control it and to make fresh appointments. Any opposition was futile, as the University had to capitulate to the Earl of Pembroke in March 1648, who expelled about 400 Royalists; and we learn that in

September, the month after the overthrow had been completed, Sydenham entered Wadham College as a Fellow Commoner. For views of some colleges at this time we can consult the volumes of Alumni Oxoniensis, one of which is before me.

Some of the men thus forcibly introduced were afterwards famous, the names including Wallis, the mathematician; Seth Ward, Professor of Astronomy, one who had been previously ejected from Cambridge; also the celebrated Willis, of the group of Invisible Philosophers, the forerunners of the Royal Society of London; there was Jonathan Goddard, Warden of Merton College and Cromwell's physician, who, it has been reported, made the first telescope in England; and many others, of whom we can learn much in the pages of the amusing, if not too accurate, historian, Anthony à Wood. He describes some of the scholars who came from Cambridge, "as the dregs of the neighbour University," as having a peculiar cut of their hair, which he styled the *committee* cut, with their clothes so shabby that they looked like apprentices or antiquated schoolboys. During the Puritan rule there were vastly more sermons than the modern Verdant Green would care to hear, much less to transcribe, which was then the regulation. In his history of the Rebellion, Clarendon confesses that the depopulation so roughly carried out "yielded a harvest of extraordinary good and sound knowledge in all parts of learning," and, as has been noticed often in the course of the world's history, a period of political or military activity is succeeded by a revival of mental and intellectual output. This was so at this time, for the Renaissance must be largely credited to the influence of the Commonwealth and not to that of Charles II., the Puritans making their appointments with great foresight, and choosing young men for promotion, while the scholars were kept under stern, steady discipline, which certainly increased their industry. Regarding medicine, Dr. Norman Moore remarked in the Fitzpatrick Lectures of last year, that "Sydenham is often regarded as the originator of modern medicine; his works might also be considered the culmination of the effects of the Renaissance." John Evelyn visited Oxford in 1654 and at other times, and in his diary has left us an impression of the people he met there; he thought Dr. Wm. Petty, who was the deputy reader in Anatomy, a genius, for indeed he was a master of many sciences, being really the one who founded the study of demography or vital statistics. Petty was a friend of Hobbes of Malmesbury, and if Sydenham had been at all interested in anatomy he could not but have benefited by contact with him, and so lessened the narrow view he always had of matters scientific, since doubtless Hobbes' method of looking at phenomena would have appealed to him, filtered as it would have been through Petty's mind. The statutes authorised one dissection yearly, performed in the Lent term if possible; and in 1650 it fell to Petty's lot to revive a woman, named Anne Greene, who had been hung at

Oxford, but whose body on being brought for dissection was found not to be dead, the case creating much interest at the time.

At Oxford at this period the opportunities for medical study were small. There was no clinical work, but a bi-weekly lecture by the Professor of Medicine on a text from the writings of Hippocrates or Galen. There was some regular teaching on anatomy, a subject which never appealed to Sydenham, and for the want of a knowledge of which he made some serious mistakes in his writings later on, as for instance in his work on Dropsy. Lower, associated in our minds with the tubercle of that name, and the all-round genius Christopher Wren—better known as an architect than as a scientist—founded their work on a knowledge of the circulation which Sydenham entirely ignored, for he said: "We may know the larger organs of the body, but its minute structure will always be hidden from us. No microscope will ever show us the minute passages by which the chyle leaves the intestine, or show by which the blood passes from the arteries to the veins," this passage being written, be it noted, twenty years after the capillaries had been demonstrated by Malpighi. In another place he stated that the human intellect will never be able to understand the use of the different parts of the brain, forgetting altogether what Galen had done centuries before, ignoring too the work of his own contemporary Willis,[1] a name familiar to us in student days by the *Circulus Willisii* at the base of the brain, for whose work on this subject Wren did the drawings. The dogmatic argument from ignorance is always illogical and generally dangerous; and one can only say in defence of Sydenham, that, like many another original investigator, he was somewhat one-sided, for in later years he had as a pupil Hans Sloane, the collector who gave that wonderful library and collection of manuscripts to London to form the nucleus of the British Museum. When this individual as a young man came to see Sydenham, bringing with him a letter of introduction, in which he was described as "ripe scholar, a good botanist, a skilful anatomist," the English Hippocrates looked him up and down, and remarked, "This is all very fine, but it won't do—Anatomy—Botany. Nonsense! Sir, I know an old woman in Covent Garden who understands botany better; and as for anatomy, my butcher can dissect a joint full as well. No, young man, all this is stuff: you must go to the bedside; it is there alone you can learn disease."

Charles II. landed in Scotland in June 1650, and, on the departure of Cromwell to meet him, a great fear arose in England that there would be a rising against the Parliament, so three thousand militia were called out, and there is much evidence that Sydenham took up an important command, for he was certainly known as "Captain." It is probable that he was with Rich's forces on the Border, and in travelling to the bridge of Warrington, where there was severe fighting, would have passed through Lancaster. A document still existing shows that in March 1654 Sydenham appealed to the Lord Protector for a grant, which was allowed to him, a sum equivalent to about £2000 of our money being given in April, with the promise of an appointment, which, however, did not mature for five years, when we find that he became Comptroller of the Pipe Office, as a laconic announcement in the "Domestic Series of State Papers" records, on 14th July 1659. On the strength of this money he married Mary Gee, of whom records are silent beyond the fact that the family came from the west of England, the couple settling in London about 1656, where he commenced to practise medicine. His residence was in Westminster, a district then swampy and malarious, for it was built over a creek of the river Thames. The marshes extended out to Pimlico, so that the present St. James' Park would have swarmed with gnats, a fact of importance as bearing on his future work on Agues and Fevers.

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[1] The discoverer of diabetes.

The English Hippocrates must have found his stock of medical knowledge small even for those days, so he seems to have decided to go to Montpellier, and that in the year 1659, for the "State Papers" contain a permit for foreign travel made out to a Thomas Sydenham. Here he became a pupil of the great Charles Barbeyrac, who had not a professorial chair owing to his being a Protestant, but from these religious views he would be the most likely one to whom a Puritan would go. Barbeyrac used to take round his students with him on his visits, and give them a clinical lecture, replying to questions; his method of treatment being simple, with but few of the very fantastic drugs then in common use. The pharmacopœia of 1677 contained both adult urine and that of a boy before puberty, the idea being that this human beef-tea would be constituted differently with the different diet usual at these two ages. Into this pharmacopœia enter for the first time jalap, serpentary, digitalis, and cinchona, but remedies like human skull, viper's flesh, millipedes occur in the *Pharmaceutica rationalis* of Willis, which had appeared the year before, viper's flesh forming one of over sixty ingredients of the *Theriaca Andromachi* contained in the pharmacopœia of Sydenham's time, which complex Venice treacle figured even in the edition of 1721.

Locke, better known as a philosopher than as a doctor, very excellently dealt with by Dr. Brown in the essay on "Locke and Sydenham," studied some years later at Montpellier, and, knowing Sydenham well, said that he had never known two men more alike in opinions and character than he and Barbeyrac. Montpellier was more the home of the doctrines of Hippocrates, the University of Paris holding more to those of Galen; but the excellences of the former school had been praised at Oxford in a book published in Sydenham's student days, which book had been dedicated to Dr. Clayton, the Professor of Medicine, and it was this work that probably decided him to prefer a visit to Montpellier. By 1660 Sydenham had returned to London, for he had an attack of the gout in that year, a malady that plagued him for the rest of his life, accompanied, as it was later on, by renal calculus and severe hæmaturia. After the three necessary examinations in 1663, he became L.R.C.P., apparently having practised illegally before that within the boundaries of London. He never was called to the Fellowship, for the bye-laws of the College only allowed this degree to be conferred on those who were already M.D., and it was not till thirteen years before he died, or in 1676, that he took this qualification, and then at the University of Cambridge, the choice of the town having been made on account of the fact that his son had entered Pembroke College as a commoner two years before this.

In 1664 plague appeared in Yarmouth, but up to Christmas the cases were only mild as we now know is the condition at the beginning of an epidemic; but Boghurst, the apothecary, whose account of the scourge is the best we have, Defoe's of course being only fiction, states that it had been in Westminster for three years before this. The warmth of the early summer revived the disease, and by June the plague was at Sydenham's own door, so the family left for Dorset, he humorously quoting as an apology for their departure, a Latin line which translated is to the effect that "Your own property is concerned when the next wall is on fire." This departure is much to be regretted from the point of view of the annals of medicine, for here was an opportunity for such a painstaking and astute observer as Sydenham to leave a grand treatise on the plague. Apart from the danger to the family, most of his patients had gone out of town, only poor persons being left to be doctored by the surgeons and apothecaries, since the physician's fee, an *angel*, was too high for them—the equivalent of a half-sovereign being called an *angel*. The herbalist Culpepper scoffingly said "that Physicians of the present day are like Balaam's Ass, they will not speak until the see an Angel," while Boghurst remarked that it was the privilege of the rich to die "surrounded by angels." In Evelyn's Diary is a reference to the use of these angel coins in the ceremony of "Touching for the King's Evil."

The condition of the poor physician of that time is thus painted for us by Cotgrave in his "Treasury of Wit and Language," printed in 1655:

> "My name is Pulsefeel, a poor Doctor of Physick,
> That does wear three pile velvet in his hat,
> Has paid a quarter's rent of his house before-hand,
> And simple as he stands here was made doctor beyond sea.

> I vow, as I am right worshipful, the taking
> Of my degree cost me twelve French crowns, and
> Thirty-five pounds of butter in Upper Germany,
> I can make your beauty, and preserve it,
> Rectifie your body, and maintaine it,
> Clarifie your blood, surfle your cheeks, perfume
> Your skin, tinct your hair, enliven your eye,
> Heighten your appetite; and as for Jellies,
> Dentifrizes, Dyets, Minerals, Fricassees,
> Pomatums, Fumes, Italia masks to sleep in,
> Either to moisten or dry the superficies, Faugh! Galen
> Was a goose, and Paracelsus a Patch,
> To Doctor Pulsefeel."

Gideon Harvey, caricaturist and court physician, said the physicians had to be on good terms with the apothecaries and go to church regularly, and that "The Church door shall no sooner be opened but *ecce* Mr. Doctor, sitting in the most visible seat, Grave, Deaf, Dumb, and immoveable as if an *Apoplexy* of Devotion had seized him, out of which his *Apothecary* is to raise him by knocking at half Sermon at his Pew-door to fetch him away post to a dying patient; by which means he draws the Eyes of the whole Congregation after him; but instead of going to the pretended House of Visitation they both drop into a *Cabaret* there to pass the fatigue of a Forenoon *Sunday*." For a similar procedure one can read Smollett's novel, "Ferdinand, Count Fathom."

Such cases of the plague as Sydenham did treat he bled, a method that Boghurst utterly condemned, and, speaking generally, he believed in the disease being disseminated by atmospheric means, although he thought that some Fomes might be necessary, so that we may say that Sydenham leaned to the views of the Localists, and it is only since the proof of the relation of rats and fleas to the disease, with the description of the bacillus, that we have made much advancement as regards its etiology. The well-known buccaneer and physician, Dr. Dover,[1] first compounder of the powder of that ilk, was treated by Sydenham for the plague he being at that time a pupil in his house, and we learn that for the first part of the illness he was not allowed to stay in bed, the idea being that this promoted the *cooling* of the fever.

During part of his residence in London, Sydenham lived in a newly built street in Pall Mall, next door to an apothecary's shop, the "Pestle and Mortar," the owner of which was a Mr. Malthus, grandfather of the author of the Malthusian doctrine of Population, who having been a sufferer from chronic arthritis for a long time, and being a patient of Sydenham's, served as the example for an accurate record of the complaint. Mr. Malthus was highly respected by the doctor, who made him the guardian of his sons, as we find by the will.

The domestic life of the great physician was happy, and he was a kind and generous parent; as a doctor, Dr. Brown declares he furnishes in himself "the four qualities Hippocrates says are indispensable in every good physician—*learning, sagacity, humanity, probity.* This personality gives a constant charm to everything he writes, the warmth of his large, humane, practical nature is felt throughout." His professional life was prosperous, notwithstanding the attacks made upon him by various other physicians, his nature being too honest and conscientious to swerve from the desire to do good to mankind; as his own words put it:

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[1] For an interesting account of Th. Dover, M.B., see a paper by Knott, *Dublin Journ. Med. Sc.*, February 1905.

> "My fame is in the hands of others. I have weighed in a nice and scrupulous balance, whether it be better to serve men, or to be praised by them, and I prefer the former. It does more to tranquillize the mind; whereas fame, and the breath of popular applause, is but a bubble, a feather, and a dream. Such wealth as such fame gives, those who have scraped it together, and those who value it highly, are fully free to enjoy, only let them remember that the mechanical arts (and sometimes the meanest of them) bring greater gains, and make richer heirs."

May we not say this, gentlemen, of the art of medicine at the present time? Sydenham never strove for riches for the sake of riches, for said he, "I have always thought that to have published for the benefit of afflicted mortals any certain method of subduing even the slightest disease, was a matter of greater felicity than the riches of a Tantalus or a Crœsus."

On 29th December 1689, at the age of 65, after being troubled with the *Dominus morborum* for thirty-five years, the prince of practical physicians passed away, and was laid to rest in St. James' Church, Piccadilly, London. At the age of 37 he had hæmaturia, and seventeen years later, in 1677, he had to retire to the country on account of the very severe symptoms of stone that made driving a misery to him, the result being that for one whole year he did not visit any patients. For gout and calculus his own personal regimen was to drink a dish or two of tea on getting out of bed, and then ride in his coach till noon; when he had a moderate, easily digested lunch, after which he drank over a quarter of a pint of Canary wine, "to promote," so he said, "the concoction of food in the stomach, and to keep away the gout from the bowels." Then he sought purer air by driving to the country, generally to Acton—would he could see it now! Small beer, weak stuff compared to our everyday ale, formed his supper, and on retiring, as he did early, he had more of this, but on the days when he had an aperient, his food was poultry, along with the dose of Canary wine. To him the best beverage for the gouty was "one which neither rises to the generosity of wine, nor sinks to the debility of water," and no doubt, in his time, London water must have been a dangerous drink unless it was *cleansed* by the addition of some alcohol! When Pepys had company to breakfast, he tells us that, "I had for them a barrel of oysters, a dish of neats' tongues, and a dish of anchovies, with wine of all sorts, and ale."

I fear, gentlemen, that I have not heeded the advice of the Book of Maccabees, but that I have been over-long in the prologue, so that time will oblige me to be short in the story itself, that is the story of Sydenham's medical works, for his theological writings I will leave severely alone. We must now turn and pass in review some interesting points in the practice of that man, who was one of the half-dozen intellectuals whose friendly visits gave to John Locke the germ of that "Essay on the Human Understanding," which has served so many thinkers as a model for the arrangement of their mental equipment in a proper manner. Sydenham's works were published in Latin, with which language he was well acquainted, Cicero being his favourite author; but Dr. Payne inclines to the view that he wrote them in English, this matter having been much discussed by the commentators on his works. The most popular work is entitled the "Complete Methods for Treating almost all Diseases," a small volume which, issued in 1693, remained the vade-mecum for physicians for over a century.

The first medical book was a treatise on fevers, an octavo of 156 pages, inscribed "Thomas Sydenham's Method of Treating Fevers, based upon his own Observations," and dedicated to the Hon. Robert Boyle, the great experimental philosopher, to whom the work really owed its origin, the man of science having often accompanied the man of physic on his round of visits. The preface is worth quoting from:

> "Whoever applies himself to medicine ought seriously to weigh the following considerations. First, that he will one day have to render an account to the Supreme Judge of the lives of sick persons committed to his care. Next, whatever skill or knowledge he may, by the Divine favour, become possessed of, should be devoted, above all things, to the glory of God, and the welfare of the human race. Moreover, let him remember that it is not any base or despicable creature of which he has undertaken the cure";

and so on runs the "Religio Medici" of the English Hippocrates, the man to whom Boerhaave metaphorically took off his hat whenever his name was mentioned. From the body of the treatise we learn that he recommended for the iliac passion—whatever that may have been—the application of a live puppy to the abdomen, and in the large section on agues he comes to the conclusion that there is a *fermentation* period of fourteen days for the fevers, which observation would come about from the number of cases of what we now call *typhus* that he had to treat at that time. One must remember that measles and scarlatina were then hardly differentiated, although Sydenham gave a remarkably clear description of the former in these words: "The symptoms of the measles do not abate by the eruption as in the smallpox, yet I never observed the vomiting afterwards, but the cough and fever increase with the difficulty of breathing, weakness of the eyes, and the defluxion on them, with continual drowsiness and want of appetite as before." The history of the word *measles* in literature is interesting and curious, but cannot detain us now: it seems wrong to assert, as has been done, that Sydenham was the first to clearly describe scarlatina.

The work on fevers was eventually recast and enlarged, in 1676 appearing as "Medical Observations about the Cure and History of Acute Diseases," wherein he laid down the general idea that fevers change their type according to the constitution of the year, and that certain diseases are associated together, which was an opinion firmly held by Hippocrates. The difficulty is to know exactly what complaint Sydenham is dealing with, for he does not give, like his great master, detailed histories of his cases. In the sixth section he forestalled modern views, for he refuses to recognise pleurisy and pneumonia or quinsy or rheumatism as *local* diseases, but states that they are *fevers*. Sydenham hoped that his book would not find less favour for being "neither vast in bulk nor stuffed out with the spoils of former authors," and he finishes with these wise words:

> "It is my temper and disposition to be careless both of the sayings and the doings of the over-proud and the over-critical. To the wise, however, and the honest, I wish to say this much: I have in nowise distorted either fact or experiment; I told the truth, the whole truth, and nothing but the truth. . . . In the meanwhile I ask the pardon, and submit to the arguments, of better judges than myself, for all errors of theory. Perhaps I may myself hereafter on many points change my word of my own accord. As I have no lack of charity for the errors of others, I have no love of obstinately persisting in my own."

Can we, gentlemen, all speak with such an anti-Chauvinistic voice? "Etiology," said Sydenham, "is a difficult and perhaps an inexplicable affair; and I choose to keep my hands clean of it. I am convinced, however, that Nature here, as elsewhere, moves in a regular and orderly manner."

Sydenham was the founder of the *expectant* treatment; in his own language the best plan, "in the midst of so much darkness and ignorance, is to wait a little and proceed very slowly, especially in the use of powerful remedies, in the meantime observing its nature and procedure, and by what means the patient was relieved or injured." In an oft-quoted passage he said that, like Hippocrates, he "found that Nature alone often terminates diseases, and works a cure with a few simple medicines, and often enough with no medicines at all." He was a great advocate of the Peruvian bark, the *Jesuit's powder* distributed gratuitously over the country by the priests, a drug which has fully justified his advocacy, and every epidemic of influenza[1] ought to make us offer up a prayer to his memory for first recognising the value of a *tonic*. Opium he also used largely, and as Sydenham's *drops*, a preparation equivalent to Vinum Opii, it figured long in many continental pharmacopœias.

To us moderns some of his treatment was fantastic and absurd, as, for instance, he believed in the idea—as old as the time of King David—of putting a child or young person to bed with an invalid, with the intention of supplying the quantity of vital spirits that may be wanting. Mr. Little, it is recorded, had been treated by violent drugs, and so Sydenham says,

> "was as weak as ever I saw any that recovered. Other treatment having failed, I told his wife that nothing could preserve his life but the putting a boy to bed with him. So she procured a link boy to lie very close to him all night. The next morning I found his fever almost off, and his eye and countenance more lively, upon which I pronounced all danger to be over. Yet afterwards, upon the recess of the boy, he began to relapse, but the boy being got again, without any more treatment he perfectly recovered."

This was an age of quacks, there was the *Aurum Potabile* over which the College of Physicians had an animated controversy, and there were numerous preparations of mercury, or *Queck-silber*,—from which is derived the title quack,—and as in the present year of grace, there flourished venereal rascals like John Archer, the Chymical Physician to his Majesty. Gideon Harvey's racy pages tell us much of these times, and his "Quidam Doctor," or the "Doctor of Contraries," a man who cured most desperate diseases by methods and remedies quite the opposite of the practice of the other practitioners of the time, is undoubtedly a hit at Sydenham, for he first introduced the *cooling* treatment for fever, and was the first to listen to the desires of the patient, and to give free permission for fluids to be drunk in a burning fever, also to humour him as regards diet, allowing, as Hippocrates said, "such food as is most grateful, though not so wholesome, is to be preferred to that which is better, but distasteful." Sydenham believed that he acted as an honest man and a good physician when he refrained entirely from medicines if the patient was not any worse than when he had visited him the time before. As regards the treatment of patients after operation, we do not yet respond sufficiently to the wishes of the sufferer, but keep too much to old rules relating to posture, diet, and many other essentials that make for lessened mental strain after such an ordeal, especially trying if this has taken place in a private house.

A celebrated tract of Sydenham's, dedicated to his friend,

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[1] Sydenham recorded the epidemic of 1675. He said coughs and colds were very common, "and they ran through whole families at once."

Dr. Thomas Short, and published in 1683, dealt with gout and dropsy; on the title-page of it is the well-known motto from Bacon's "Advancement of Learning," an author beloved by our Hippocrates, the translation running: "We have not to imagine, or to think out, but to find out what Nature does or produces." In the body of the work he says:

> "It is my nature to think where others read; to ask less whether the world agrees with me than whether I agree with the truth: and to hold cheap the rumour and applause of the multitude. . . . For what can it profit me after my death if the eight letters which compose the name *Sydenham* should pass from mouth to mouth among men who can no more form an idea of what I was than I of what they will be."

This latter portion of the passage is referred to by Fielding, himself a sufferer from gout, in the second chapter of Book xiii. of "Tom Jones." Sydenham's tract is a masterpiece, as he gives an unequalled description of an attack of the gout, apologising for the small list of remedies of use in the complaint, supporting his opinions by quoting from Lucien's "Chorus," at the same time feeling satisfaction that it kills more rich than poor, and that it is an appanage of the great, for it affects alike generals, kings, and philosophers.

His fame rests too on his great work on Hysteria, which, to him, accounted for one-sixth of all maladies, women being rarely free from it. His explanation of it amounted in substance, if not in language, to our modern knowledge that it is due to disordered innervation, or, as he put it, to "animal spirits" rushing down on the organ, exciting spasm and pain, thus "creating the proper symptoms of the part." Of course he carried the idea of hysterical causation too far, for he included ovarian dropsy and chlorosis in the group, yet he did much practical good in the treatment of the latter, for he advocated restoring the blood by giving *steel*, for which purpose he used doses of the filings; so that when we prescribe "bark and steel" we are only re-echoing the practice of Thomas Sydenham.

Mere mention must be made of what is considered his discovery of chorea, that is, chorea minor or Sydenham's chorea, as opposed to chorea major, the rare epidemic hysterical dancing mania of the Middle Ages, so far unknown in England, and the real St. Vitus' dance. He defined chorea as

> "a sort of convulsion which chiefly invades boys and girls from ten years of age to puberty, showing itself first by a certain lameness or rather instability of one of the legs, which the patient drags after him like a fool."

As this description hardly corresponds with our present-day notions of an attack of chorea, it has been criticised notably by Sturges in his monograph on "Chorea and Whooping-Cough."

This description was the last literary effort that Sydenham undertook, for on 29th September 1686 he wrote: "And this is about the sum of all I know respecting the cure of diseases, up to the day on which I write." Just over three years later he was laid to rest.

The philosopher of Scotia, Dugald Stewart, said that Sydenham's method really belonged to his great friend John Locke, who, being a thoroughgoing sceptic, used to say that the art of medicine was to be properly learnt only from its practice and its exercise. To his friend Molyneux, Locke wrote that "You cannot imagine how far a little observation carefully made by a man not tied up to the four humours; or sal, sulphur, and mercury; or to acid and alcali, which has of late prevailed, will carry a man in the curing of diseases, though very stubborn and dangerous, and that with very little and common, and almost no medicine at all." The reference to the *four humours* is to the dogmas of Hippocrates and Galen; *sal, sulphur* refer to Paracelsus, the alchemist, and to Van Helmont, the philosopher-mystic, to whom we owe the term *gas; acid* and *alcali* are concerned in what was then the new chemical system of Sylvius, which was extended by Willis. Locke was a Fellow of the Royal Society, as was Robert Boyle, a Society with which Sydenham would never have aught to do. Had not that common arbitrator, Time, been against me, I would have liked to have said more about the relation of Locke to Sydenham: yet what words of mine could bear comparison with those written by the author of "Rab and his Friends," so I counsel everyone who enjoys good essays to smoke several pipes over the first series of "Horæ Subsecivæ,"—for this section appeals most to medical men, and especially to Edinburgh graduates,—with the page open at the part where these two philosophers are dealt with, turning, after this essay is read, to the one on "Dr. Andrew Brown and Sydenham." If the members do this, my own words will not have been written in vain.

Thus, gentlemen, ends my tribute to the memory of him who would have been styled by Plato an *artsman*; for Sydenham was a doer, not an abstract thinker, in that "tentative art" to succeed in which Hartley Coleridge said demands

> "a quickness of eye, thought, tact, invention, which are not to be learned by study, nor, unless by connatural aptitude, to be acquired by experience; and it is the possession of this *sense*, exercised by a patient observation, and fortified by a just reliance on the *vis medicatrix*, the self-adjusting tendency of nature, that constitutes the true physician or healer."

Said Hegel: "A great man condemns the world to the task of explaining him"; this then must be my apology for such a "bald and unconvincing narrative,"—for I hope you will seek for further information about the English Hippocrates in Dr. Payne's monograph,—it being apposite that at the literary evening during the eighty-fourth year of the existence of this Book Club we think of those great men in our commonwealth of medicine who are, as Burke said, "the guide-posts and landmarks in the State." As this is the time to think of books, let me offer to you this expostulation, couched in the lines of Wordsworth:

"Where are your books?—that light bequeathed
To beings else forlorn and blind!
Up! up! and drink the spirit breathed
From dead men to their kind."

Considering the nature of the subject, I confess that this paper has been compiled too hurriedly; yet I have kept in mind during its preparation the motto from the Book of Ecclesiastes that is written on the manuscript copy of Sydenham's "Medical Observations," which now rests on the shelves of the library of the College of Physicians of London: "Whatsoever thy hand findeth to doe, doe it with thy might."

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Diseases of the Lungs. By ROBERT H. BABCOCK, M.D. London : Sidney Appleton.

THIS is a comprehensive and thoroughly practical treatise on diseases of the lungs, which is worthy the high reputation enjoyed by Professor Babcock, not only in America, but also in this country. Every page affords evidence of the author's clinical acumen, of his accurate observation, and of his wide acquaintance with the literature of his subject; the text-book ought, therefore, to secure a place among the recognised authoritative treatises on diseases of the chest. The volume opens with an account of bronchitis; a noticeable feature here, as in the other chapters, being the prominence given to recent bacteriological work. After discussing the clinical manifestations of the disease, the author takes up the question of treatment. Great stress is laid, and rightly so, on the importance of treating concomitant throat affections; for these are often the starting-point of recurrent bronchial catarrh, and until they are cured there is great tendency to relapse. Another feature in the treatment advised is the somewhat extensive use of cold compresses; for some reason or another, these seem never to have been as generally employed in this country as they deserve. Bronchiectasis is fully considered. The late Sir Thomas Grainger Stewart's work in this connection deserves reference among that of the other authorities quoted. Dr. Babcock, however, is not inclined to dogmatise on theoretical matters; pathological theories are relegated to their proper place, and subordinated throughout the book to matters of greater clinical importance. A minor point referred to, which often escapes mention, is the comparatively short time required for the development of clubbing of the fingers in chronic lung disease. In the chapter on asthma, the statement that morphia is the safest remedy for the paroxysm surely requires more qualification than it receives. The dangerous symptoms which sometimes follow its injection in this disease certainly indicate caution in administering it. Morphia, however, is one of Dr. Babcock's favourite remedies, and he seems to use it more freely than the majority of physicians. Under pulmonary hæmorrhage, reference is made to the occurrence of this in old people with thickened arteries apart from lung disease. Such cases are not very common, and are very liable to be mistaken, so that it is well to have attention drawn to them. Among the remedies advised for hæmorrhages, the use of large doses of atropin to dilate the cutaneous vessels is somewhat novel, and appears rational. A note of warning against adrenalin in this condition is struck. The longest articles in the volume are those on acute pneumonia and pulmonary tuberculosis; they are excellent in all respects. It is evidently the experience in America, as here, that acute pneumonia is more virulent in type than formerly. The special modes of treatment which have been proposed are discussed, and none secures a favourable verdict. Dr. Babcock's cardinal rules are plenty of fresh air and water, and he is a believer in the external application of cold to control pyrexia. The drugs he rates most highly are digitalis, camphor, caffeine, and musk. Digitalis he gives in large doses, but only at the onset of the attack. Strychnine he does not favour. One naturally looks with interest for his opinion of alcohol. Like most other physicians, he is no extreme advocate of this drug, but the reasons which guide him in prescribing it are worthy of mention. He looks on it as acting as a vaso-dilator, and orders it only when the heart's action is becoming more frequent and the sounds feeble, provided the pulse tension be not low, and cyanosis be slight or absent. The view that the benefits of alcohol in pneumonia are due to its calmative effect on the nerve centres is not referred to. No one can read this chapter without deriving benefit from the suggestions it yields. The only caveat we have to enter is, again, against the rather free use of morphia advised. Marked cyanosis is usually held to contra-indicate it, and for the present this is a safer line to follow than Dr. Babcock's practice. Turning to the chapter on tuberculosis, no definite opinion is given as to the transmissibility of bovine tubercle to man. The early recognition of phthisis is well described, without undue insistence on minute refinements. Dr. Babcock ardently supports administrative control, though admitting that it may bear hardly on individuals. Sir A. E. Wright's work is referred to, but not at such length as its importance merits. The concluding chapter of the book deals with diseases of the pleura, and fully reaches the high standard of the rest.

The book contains a great many case records, which are well selected, and almost all valuable in bringing out special points of clinical interest. As we have already indicated, the large amount of space devoted to practical matters, and especially to treatment, gives the book a character of its own, and makes it essentially one for the practitioner. It ought speedily to become a standard work on lung disease.

Physical Diagnosis. By HOWARD S. ANDERS, M.D. London: Sidney Appleton.

FOR some reason, perhaps the intricacy of the subject, most authors seem chary of attempting to encompass in one volume the whole field of medical diagnosis; so that, with a few exceptions, such as Sahli's great work, books of diagnosis may be classified in two orders—those dealing with chemical and microscopic methods, and those treating of auscultation and percussion. Fashion, apparently, decrees the former to be "clinical," the latter "physical" diagnosis, and the general scope of Dr. Anders' book is well enough defined, according to this nomenclature, by its name. It is a somewhat bulky treatise on the inspection, palpation, percussion, and auscultation of the heart, lungs, and abdomen, very much on the lines of Guttmann's "Handbook," but modernised to suit present-day needs. Although we are at one with the author in thinking that the student of to-day is less apt at employing his fingers and ears for diagnosis than his predecessors, we fear that few students will have time to give this book the study it really deserves; for, as we have said, in his anxiety to do full justice to the subject, Dr. Anders has written a very solid, bulky volume. This seems to us the only drawback to the book, for after a very careful perusal of its contents we find little to criticise. Great attention is paid throughout to the need for a proper technique, and this is undoubtedly wise. Among the new instruments described, we notice two which have apparently been invented independently in America and in Edinburgh, and it may be elsewhere as well. One is Hall's chest pantagraph (p. 38), and the other the author's binaural chest-piece. The first of these is absolutely identical with Graham Brown's cyrtometer, introduced about ten years ago, but never, we think, very widely employed; the other is practically the same as what is known here as Thomson's chest-piece. Dr. Anders seems to prefer the binaural stethescope for general use, particularly for the heart. We have always thought that, if the instrument was in any respect inferior to the single one, it was in being less discriminating as regards cardiac bruits; this, however, may be a matter of opinion. The accounts of topographical anatomy, and the various descriptions of pathological and physiological physical signs are thoroughly sound and accurate, and in consonance with modern views. Illustrative cases, showing how deductions are made, lighten the text to some extent. The description of the pulse is hardly so satisfactory as the rest, and the passages referring to pulse tension and its estimation are not particularly clear. The sphygmanometer and other instruments for studying the circulation are described, and the book concludes with a chapter on X-ray diagnosis, illustrated with some excellent skiagrams. We have formed a high opinion of the general accuracy of this book, and it will be found a safe guide for the student. It is well illustrated, many of the plates, however, being borrowed from other sources.

Cancer of the Rectum. By HARRISON CRIPPS. Fifth Edition. London: J. & A. Churchill.

IT can hardly be said of this book that it will add to the present reputation of its author. It is difficult to conceive the extent to which it is behind the times. The illustrations, which are for the most part reproductions of drawings by Mr. Cripps, although no doubt admirable efforts on his part twenty-eight years ago when the first edition was published, have now at the most only a sentimental interest and little or no practical use whatsoever.

The section on Anatomy and Physiology also presents some astonishing features, and we need only instance in this connection that he takes two or three pages in the endeavour to support a theory that the leucocytes in the wall of the rectum are formed by the epithelium of Lieberkühn's follicles.

When we turn to the operative treatment of cancer of the rectum, we find the poorest description of the high trans-sacral operation which it has been our lot to see in print. To show that we are not exaggerating, we may quote the following from page 139: "The lateral attachments of the soft parts and the ligaments being separated along the lower border of the sacrum on either side by a careful dissection, the sacrum is sawn across at a height of two or three inches and removed. By care, and not cutting too high, the sacral plexus is safe. An excellent view is obtained of the lower five or six inches of the rectum, which can thus be removed by a comparatively easy operation." Surely no licensing body would accept such looseness of description on the part of a candidate, and yet this is the fifth-edition text of a specialist in a monograph on his own subject.

Manual of Anatomy. By A. M. BUCHANAN, M.A., M.D., C.M., etc.
Vol. ii. London: Baillière, Tindall, & Cox.

THE parts of the body treated in this volume are the abdomen, the thorax, the head and neck, the nervous system, and the organs of special sense.

As in vol. i., an attempt has been made to combine systematic and regional description; and it is a practical dissecting guide in respect that at the end of each of the parts, detailed instructions for dissection are introduced. The microscopical characters of the various organs are adequately dealt with, and following the descriptions of the organs and vessels succinct accounts of the development are given.

Considering the sufficiently large number of existing text-books on anatomy and of dissecting guides, the method of combining systematic and regional anatomy is the best that could be adopted for introducing a new book. It is not easy, however, to forecast what measure of success will attend its publication; for, while it may present the advantages of both a systematic and a practical text-book, yet it may be said that it is neither the one thing nor the other.

In this volume the "regional" character predominates largely over the "systematic"; and it is impossible that it should be otherwise if it is in any sense intended to be a practical book; but the difficulties of combining the two different kinds of description are so great that the author is to be congratulated on the extent to which he has been able to overcome them.

The volume is of a convenient size. The descriptions are complete and up to date, and the information accurately and concisely expressed. The illustrations as a whole are good, but there are some, especially in the section dealing with the brain, which could be improved. Many of the figures are taken from old text-books and their source acknowledged, and almost all these could with advantage be replaced by original drawings.

Black type is employed extensively throughout the text and with discernment, but it would have been an improvement if the headings of the sections had been more distinctive, or if the book had been divided into chapters. In many cases the type of the heading resembles too closely the black type on the rest of the page, and section appears to succeed section in a monotonous fashion.

While no exception can be taken to the nomenclature employed, it might be suggested that the term "areæ" savours of pedantry, and the name "deferential artery" is one to be abandoned. At the end of the book there is a serviceable appendix containing the Bâle nomenclature and a glossary. The usefulness of the latter could be enhanced by adding the derivation of each word.

The book will be found of service to the student or the practitioner who wishes to revise any part of the body from the regional point of view, and at the same time to revive his knowledge of the histology and development of the part.

Essentials of Chemical Physiology. By W. D. Halliburton, M.D., LL.D., F.R.S. Sixth Edition. London: Longmans, Green, & Co.

During the last few years great advances have been made in our knowledge of physiological chemistry. The work of Emil Fischer and others has cleared up a great deal of the mystery surrounding the composition of proteids and their relationships to one another. The results are far-reaching in their application to the chemical processes which go on in the absorption of food and in metabolism, and our conception of this great branch of physiology has consequently undergone important changes. The very terms employed in the designation of albuminous substances have been found inadequate, and in many cases unsuitable. A joint committee of the Chemical and Physiological Societies of Great Britain, under the chairmanship of Professor Halliburton, was entrusted with the drawing up of a new nomenclature, and the result of its deliberations, after free discussion during the past year, now forms a temporary basis for the description and classification of the important group of chemical substances known as proteids, or "proteins" according to the new nomenclature. The classification is admittedly a temporary one, and much remains to be done before a really scientific arrangement is possible.

The appearance of the sixth edition of the "Essentials" at this juncture is an opportune one. The book has already established its reputation, and no one is in a better position than its author to appreciate and utilise to the full the trend of modern work. A thorough revision has been found necessary, not only of the part dealing with proteins, but of others, such as the sections relating to respiration and the coagulation of blood.

The book is divided into two parts; the larger one is intended to serve as an elementary course, while the other takes up subjects more suitable for the senior student. An appendix gives a description with illustrations of many of the instruments employed in physiology, and there are a few pages at the end devoted to physical chemistry. The text is chiefly concerned with the theory of physiological chemistry, but at the beginning of each lesson practical exercises are given. These are sufficient to enable the student to go through a practical course; but the value of the book lies more in its descriptive matter, and the exercises occupy a subordinate position. Micro-chemical tests for iron and potassium are omitted, a micro-chemical test for glycogen is given, but more space might with advantage have been afforded to this subject. A few misprints are noticeable; the old term "proteid" appears, and that in a headline among proteins in one place.

The book is a valuable addition to the literature of physiology, and to a branch of it in which an authoritative up-to-date work was much needed.

Elements of Human Physiology. By ERNEST H. STARLING, M.D., F.R.C.P., F.R.S. Eighth Edition. London: J. & A. Churchill.

THE eighth edition of this well-known text-book maintains the high level of usefulness reached by its predecessors. It is deservedly one of the most popular of the many text-books of physiology, presenting as it does all that is essential to the student in a small compass and in language so simple and clear that subjects usually considered difficult are readily followed and understood. The book is especially adapted for the use of students of medicine: it gives a full and well-balanced exposition of the principles of physiology, with sufficient details for ordinary purposes. At the same timei t is not a cram book, and does not attempt to usurp the position of the larger works of reference.

One of the most noteworthy features of the present edition is the adoption by the author of the new nomenclature and classification of proteids; this alone will enhance its value to students preparing for examination.

The subject-matter has been brought well up to date, and recent advances in knowledge have been incorporated. The chapter on the mechanism of digestion is particularly good. This is what one would expect, as the author has himself been responsible for much of the recent work in this department. The chemistry of digestion and absorption receives very adequate treatment, and no part of physiology has grown so rapidly of late years. The amino-acids have acquired great importance, and considerable attention is given to them. The book is remarkably even all through, and can be thoroughly recommended.

Cancer of the Breast and its Operative Treatment. By W. SAMPSON HANDLEY. London: John Murray.

AFTER an elaborate and painstaking investigation on the mode of dissemination of cancer of the breast, Mr. Handley has formulated his views in the work before us, which constitutes a closely reasoned plea for the "permeation hypothesis." He has endeavoured, and with very considerable success, "to present for the surgeon's use a careful picture of a breast cancer, of its microscopical ramifications, and of its mode of dissemination," and having done so he proceeds to discuss the various methods of removing the disease in the light of his conclusions regarding its pathology.

There is much cogency in the author's argument against the "embolic theory," which he maintains "is not, standing alone, an adequate and complete explanation of all the remote metastases in cancer." Even the subcutaneous nodules so frequently seen in breast cancer are due, he says, not to blood embolism, but to the growth of cancer along lymphatic vessels. He goes so far as to say "that blood embolism appears to be an event of exceptional occurrence, and one which, even when it occurs, is usually rendered ineffectual by the destruction of those cancer cells which gain access to the blood stream." The full weight of these statements is only appreciated after reading the two succeeding chapters on "parietal dissemination," in which the author seeks to prove that it is due to "a slowly progressive, centrifugal, quasi-serpiginous spread of the breast cancer in the parietes, in continuity with the primary growth, and independent of transport by the lymph or blood stream. In these sections much confirmation is given to previous work regarding direct centrifugal spread of cancer; and an admirable series of micro-photographs serve to illustrate the author's thesis.

With regard to visceral metastases, Mr. Handley maintains that they "mainly arise from the extension of cancerous permeation along the numerous fine anastomoses which, piercing the parietes, connect the lymphatic plexus of the deep fascia with the sub-endothelial lymphatic plexuses of the pleura and peritoneum, and with the mediastinal and portal glands." Special stress is laid on the importance of invasion of the abdomen by direct spread through the epigastric parietes.

Mr. Handley makes no claim to having devised a new operation for cancer of the breast, but he has formulated a plan, based on his pathological observations, which seems to meet the indications for complete extirpation of the local disease.

While there is much in this monograph that is open to discussion, it must be accepted as a sound, scientific contribution to the subject, and Mr. Handley is to be congratulated on having accomplished a valuable piece of work.

Recent Works on Orthopedics. By Dr. F. Calot of Berck-sur-Mer.

About ten years ago, Dr. Calot rapidly attained a world-wide notoriety through his papers on the forcible correction of the angular projection in Pott's disease. His method was tested in a large number of medical centres, and in a short time was condemned and abandoned. During these ten years, however, Calot has continued his orthopedic work, has revolutionised his methods, and has published a series of books, intended to form a complete system of orthopedic surgery.

The industry and capacity of the man are truly remarkable, and all his books are characterised by thoroughness, clearness of exposition, great attention to the details of treatment, and a wealth of illustrations in the shape of sketches, photographs, and Röntgen pictures. Calot is an enthusiast in the cause which he appears to have most at heart, namely, the dissemination of the knowledge of the treatment of deformities among general practitioners, in preference to its being confined to the hands of specialists in the larger medical centres; he goes a little far, perhaps, when he contends that such conditions as congenital dislocation of the hip are amenable to treatment by those who are engaged in general practice, but his aim is at all events a most laudable one. In this country, at any rate, the knowledge of orthopedics possessed by the average general practitioner is of a very limited character, being often insufficient to enable him to recognise many of the affections of the skeleton included under this head, far less to undertake the treatment thereof.

In the first of the series of books sent us for review—"Traitement Rationnel de Mal de Pott a l'usage des praticiens" (Paris: Octave Doin, 1906)—our interest is mainly centred in the author's attitude with regard to the correction of the angular deformity of the spine, and we find that he has modified the original method of forcible and immediate correction. His present procedure is as follows:—The child stands in the upright posture with the head slung from above so as to extend but not suspend the body, that is to say, the heels as well as the toes remain in contact with the ground. A plaster jacket is then applied over a jersey, and for lesions above the mid-dorsal region the jacket extends to the base of the skull. Two or three days later, when the plaster is thoroughly dried, an oblong window is cut out of the case over the angular projection, and the exposed portion of jersey divided in the form of a St. Andrew cross. The skin having been smeared with vaseline, squares of cotton-wool (1 cm. in thickness and larger than the window by 3 or 4 cms. both in length and breadth) are introduced one by one and smoothed out over the projection, their edges being overlapped by the edges of the plaster case. From seven to nine of these squares are introduced in the first instance, one on the top of the other. A gauze bandage is now wound round and round the case so as to exert equable compression over the projection. In the course of two or three weeks, when the bandage and the squares of wool are removed, there is already seen a reduction in the gibbus, so that on repacking one is able to insert from twelve to fifteen squares of wool. Two months later the number will be increased to eighteen. The wool is renewed every two months, and at the end of five or six months the plaster case is also renewed. In the course of fifteen or eighteen months small and even medium projections will be completely corrected, but the plaster treatment must be continued for three years at an average, or it may be even five or six, in order to obtain anklyosis of the spine. The plaster case is finally replaced by a strong celluloid corset. The essence, therefore, of his present method is that instead of correcting the gibbus at one sitting, it is carried out in five, ten, or fifteen sittings.

"La Technique du Traitement des Tumeurs Blanches" is on similar lines to and shows also an evolution of treatment, the result of increasing experience. In his earlier years he was an advocate of the operative treatment of tuberculous disease of bones and joints, and this was followed by a period in which treatment was entirely confined to conservative measures. Now, and for the last ten years, the treatment consists almost exclusively of intra-articular injections, and he maintains that the results during the third period are incomparably superior, both in number and in quality. A further merit of the injection treatment, which specially appeals to Calot, is the simplicity of its execution, which permits of its being carried out "par tous les médecins sans exception." The fluids employed for injection are two in number: the first is a mixture of equal parts of iodoform dissolved in ether 10 per cent. and creosoted oil 4 per cent., while the second is a mixture of camphorated naphtha and glycerine. The iodoform and creosote injection is employed by preference in tuberculous hydrops and in cases where the granulation tisssue is extensively broken down.

The treatment, together with the plaster-of-paris splints and other appliances, is very fully and clearly described, every step being illustrated by drawings or photographs.

The third volume sent us for review — "Die Behandlung der

Angeborenen Hüftgelenksverrenkung," Übersetzt von Dr. P. Ewald (Stuttgart: Ferdinand Enke, 1906)—is written and illustrated on similar lines. While there is nothing strikingly new or original in Calot's methods in the treatment of congenital dislocation of the hip, his descriptions are so clear, and the illustration of every detail so complete, that the book constitutes a very valuable addition to the literature of the subject. The author once more expresses the hope that with the help of his book the treatment of congenital dislocation of the hip may be carried out by the general practitioner.

These, and other volumes by the same author, testify to the extraordinary industry of the man, and to the thoroughness with which he has devoted himself to the exposition of the practical details of treatment. He is thoroughly in earnest, and the conclusions which he draws from his ripe experience are worthy of receiving the confidence of other workers in the same field.

The photographs which he exhibits of cases before and after treatment, and the large number of X-ray photographs, afford conclusive proof of the truth of his contentions and of the excellence of the results which he has obtained.

Prevalent Diseases of the Eye. By Samuel Theobald, M.D.
Philadelphia and London: W. B. Saunders Company.

This treatise on the eye is intended to meet the needs of the general practitioner, and with this aim in view the author has assumed that the practitioner is not skilled in the use of the ophthalmoscope, that he has neither the experience nor the necessary paraphernalia to make trustworthy tests of refractive errors, of muscular anomalies, or of the visual fields, and that he is not qualified to perform and has no desire to undertake the more delicate eye operations. On the other hand, there are other important affections of the eye which he is competent to diagnosticate correctly and to treat successfully, and therefore special attention is devoted in the book to this latter class of maladies. The author has endeavoured to help the practitioner to discriminate between these cases and those which are without his province, and so help him to avoid sending trivial affections to the specialist, or, on the other hand, losing precious time through attempting to cope with maladies which urgently demand the skill of the trained ophthalmologist. For the same reason the commoner affections are more fully dwelt upon, a sharp line is drawn between diseases in which delay is permissible or even desirable, and those in the treatment of which time is an all-important factor. Suggestions as to treatment are concise, unambiguous, and as specific as practicable, and the simpler operations alone are described in detail.

The result is an admirable book which deserves success, and we feel sure the treatise will be welcomed by the profession as supplying a real want.

In the list of remedies, local and constitutional, the application of which the reader must know, the salicylates have been inadvertently omitted.

Oblique illumination of the eye is described in detail as a method of examination which should be mastered by every one, owing to the great help it affords in the investigation of the anterior structures of the eye.

The chapter on glaucoma is written with admirable clearness, as also is that on diseases of the crystalline lens. Under anomalies of refraction, the author has something to say of "the jeweller's clerk" who, after a few weeks of instruction in "an optical college," announces himself as an "examining" or an "ophthalmic" optician. How much harm the community suffers from such tyros he considers it would be difficult to estimate.

At the end of the book are given a number of formulæ for local and constitutional remedies. The book is illustrated by nearly two hundred figures and ten plates, some of which are coloured.

In his design to produce a treatise on diseases of the eye which will be a boon to the medical man in active practice, Dr. Theobald has succeeded, and succeeded thoroughly.

Degeneration in Families. By Dr. Fr. Lange. Translated from the Danish by C. Chr. Sonne. London: H. Kimpton.

The title of this book leads one to expect much instructive information; but it may at once be said that Dr. Lange's treatment of it has not been entirely successful. He is much too discursive, and his arrangement of his material is neither clear nor practical. It is a pleasant enough book to read, but it is not scientifically satisfactory. It is the outcome of his experience as a physician in a Danish asylum, which appears to have patients belonging to all classes of society, so that his opportunities for observation have been unusually varied.

He first draws an analogy between the family and the individual, and shows that both are subject to the same stages of growth, maturity, and decline. He traces the operation of this process in the case of many of his patients, and endeavours to ascertain the lines along which the decline or degeneration proceeds. There are three which he considers very common—the line of mental disease, of alcoholism, and of epilepsy. In these the manifestations of degeneration throw a dark shadow without redeeming features. But cases such as these do not exhaust all the facts. He finds that in others the process of decline is attended by a peculiar blazing up of the psychic forces in some particular direction, especially in the region of imagination and emotion. The members of such families attain eminence in a greater proportion than the normal, especially in directions along which the artistic temperament finds an outlet for its energies. But for all that it is a degeneration. This, he thinks, is the basis of the dictum—Genius is a neurosis. In his experience such manifestations are usually associated with the uratic diathesis, which he regards as evidence of nutritional degeneration. The rest of the book is concerned with the investigation of degeneration as it manifests itself in the individual, and with the relation of this to the social organism.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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THE AFFERENT NERVOUS SYSTEM.

A SECOND instalment of Dr. Head's epoch-making researches on sensation appears in the current number of *Brain*, London (1907, No. 116). His previous communication (abstracted in this Journal, January 1906) dealt with the transmission of sensory impulses in the peripheral nerves, and in it he conclusively proved that the sensory mechanism at that level consisted of three systems—(1) *Deep sensibility*, capable of answering to the stimulus of pressure, and of movement of muscles, tendons, and joints. Painful impulses arise within this system when the pressure is severe. The fibres concerned in deep sensibility run mainly in the muscular nerves. (2) *The protopathic system*, capable of response to painful stimuli, and extremes of heat and cold above 50° and below 20° C. (3) *The epicritic system*, by which cutaneous localisation, the discrimination of two compass points, and the recognition of the finer grades of coolness or warmth, between 20° and 50° C., is made possible. The protopathic and the epicritic fibres run in the cutaneous nerves. The present communication is a continuation of this research, and deals with *the grouping of afferent impulses within the spinal cord.* It is found that whereas in peripheral nerve lesions deep sensibility to pain may be preserved although protopathic sensibility to pain is lost, and whereas sensations of warmth or coolness (20°–50°) may be unappreciated although extremes of heat and cold are felt if the lesion be a central one affecting the spinal cord, all forms of sensibility to pain are abolished together, and so with all sensibility to variations in temperature. There is, therefore, in the cord no longer any question of protopathic, epicritic, or deep sensibility; the impulses have undergone a fresh grouping, and must be conducted by specific tracts for pain, touch, heat, and cold.

The care with which Dr. Head's investigations are conducted can scarcely be appreciated without a study of his methods, and the manner in which fallacies are eliminated. This section of his paper merits careful study by those who have to deal with nervous cases, and for details the original must be referred to.

Sensations of pain.—After division of a cutaneous nerve, pain is abolished only in so far as tactile sensibility is absent; deep sensibility remains, and with it the potentiality of producing pain by deep pressure.

When a cord lesion abolishes the conduction of painful stimuli the analgesia is complete, both superficial and deep (pressure) pain being absent; yet the patient may be able to appreciate light touches, as well as passive movements and position of the limbs.

Heat and cold.—The fibres conveying sensations of temperature undergo an even more complete reconstitution in the cord. Division of either the epicritic or the protopathic fibres interferes respectively with the recognition of minor or extreme degrees of heat and cold. When, however, the lesion is in the cord, all sensibility to heat or all sensibility to cold may be destroyed. Impulses which convey epicritic and protopathic sensations of heat evidently converge to one tract, those which convey epicritic and protopathic sensations of cold to another. In intramedullary disease we may find such a state of matters as follows: All temperatures from 30° to 60° are recognised as more or less warm, whereas no temperature below 30° is detected as cold. Such a phenomenon is never met with in a peripheral lesion, the rule there being to have abolition either of protopathic sensiblity (below 20° and above 50°) or of epicritic sensibility (between 20° and 50°). Insensibility to heat or cold from spinal lesion may be absolute, and yet the patient may be able to recognise the lightest tactile stimulation and to discriminate the two points of the compass. Such never occurs in lesions of the peripheral nerves only.

Light and deep touch.—In peripheral division of nerves, one of the chief features is the abolition of sensibility to light touch, with its retention to deep touch and pressure. In intramedullary lesions all these tactile sensory impulses disappear together, yet along with abolition of the sensation of deep pressure the passive position of the limbs is perfectly appreciated.

Passive position and movement.—In peripheral lesions the power of recognising passive movements, the sense of pressure, and the pain of deep pressure, are all either present or absent together, but in an intramedullary lesion the power of recognising the position of a limb is dissociated from the afferent impulses produced by pressure, and we may have either abolition of the sense of position and passive movement with persistence of all tactile sense, or *vice versâ.*

The compass test.—The power of discriminating two points and the sensibility to light touch (epicritic system) run parallel in peripheral lesions, but in intramedullary disease the lightest touch may be felt, yet the power of localising points may be absolutely gone.

We thus see that the various impulses which run in the epicritic, protopathic, and deep systems, when they enter the cord, become rearranged,—pain-conducting fibres from protopathic and deep systems, heat and cold-conducting fibres from epicritic and protopathic systems, tactile impulses from epicritic and deep systems, the sense of position and (as we shall learn) the power of discriminating points from deep and epicritic systems, merging into separate tracts, each conveying its specific set of sensations regardless of whether they have come from the epicritic, protopathic, or deep peripheral fibres. What, then, is the course and relation of these newly constituted groups of afferent impulses in the cord? The answer to this is supplied by Head's investigations of eight cases of Brown Séquard's paralysis.

Pain, heat, and cold.—These sensations pass up the opposite side of the cord. They are closely associated, but not inextricably intermingled, for one lesion may abolish the sensations over different cutaneous areas, and one sense may even escape entirely. The three forms of sensation tend especially to be unequally affected in lesions of the cervical cord.

Touch and pressure.—These are less frequently disturbed in Brown Séquard's paralysis than the foregoing group, but when they are affected the loss is on the side opposite the motor paralysis. Hence these impulses, too, pass up the opposite side of the cord.

Passive position and movement.—Brown Séquard stated that when this sense is affected it is lost on the side which is paralysed, and Head is able to confirm this observation. A patient suffering from Brown Séquard's paralysis underwent laminectomy, and after the operation lost the sense of position and passive movement on the paralysed side. Thermal sensibility and pain were abolished on the opposite side. The loss of sense of passive movement and position is quite independent of the tactile sense, but is closely associated in Brown Séquard's paralysis with inability to discriminate two compass points, the two sets of impulses being impaired together.

From the above it seems that the sensations of pain, heat, cold, touch, and pressure cross in the cord and pass up the opposite side; while those of locality, passive movement, position, and discrimination of compass points, pass up the cord without crossing.

The phenomena hitherto described deal with the sensory disturbances of parts remote from the cord lesion; but in Brown Séquard's paralysis, of course, local sensory disturbances are also produced. These, in contradistinction to the former, are on the same side of the body as the lesion and motor paralysis, but otherwise the grouping of the phenomena follows the central, not the peripheral type.

Afferent segmentation within the cord is next critically discussed, the findings in organic lesions being compared with the results obtained by Head from his examinations of the posterior root ganglia in zona, and of the hyperæsthetic areas of visceral disease. His conclusions are—(1) The sensory disturbance at the level of the lesion shows signs of intramedullary segmentation; (2) the remote disturbance of sensation on the side opposed to the lesion may show signs of intramedullary segmentation; (3) the remote analgesia and thermo-anæsthesia produced by lesions of the cervical cord point to a lamellar arrangement of sensory impulses in this region. The fact that in spinal disease sensation is not infrequently retained over the sacral region, though lost elsewhere, points to the fact that caudal sensory impulses pass up in paths distinct from those leading from the lumbar and thoracic regions.

Passage through the spinal cord of afferent impulses concerned with localisation.—We have seen that in peripheral nerves these sensations are associated with that of deep pressure. A cord lesion may cause dissociation of the two sets of impulses, one being lost, the other preserved. Loss of recognition of articular movement occurs on the side of the lesion, hence the sensory path is uncrossed. Therefore the local effect of an intramedullary lesion differs from the remote effect in this way—that whereas in the latter the loss of sensibility on the side opposite the lesion is partial, the sense of position remaining intact, in the former *all* forms of sensibility are lost together.

Impulses connected with tactile discrimination.—The fact that the compass test varies according to the state of the sense of passive position has been alluded to. Head points out that the test has generally been used as a measure of tactile sensibility. He has, however, found that the lightest touches may be distinctly felt by a patient, who yet makes the grossest errors in estimating the distance separating two compass points. When this occurs the area which is irresponsive to the compass test is on the side of the lesion. It is therefore apparent that the power of discriminating the distance apart of two cutaneous stimuli differs from tactile sensibility in general both in its nature and in the course of the impulses up the cord. The path is an uncrossed one, not crossed like the latter. The *faculty of tactile localisation*, however, is due to impulses which run in the cord separately from those of tactile discrimination. Tactile localisation is tested (*a*) by asking the blindfold patient where he is being touched ("spot-naming"), and (*b*) by asking him to point to the spot touched. The latter method, however, implies two faculties—the power of tactile localisation *plus* the sense of passive position. If the latter sense be lost, the patient may be able to name the spot correctly, yet cannot point to it on account of his defective knowledge of its position in space. Therefore at the spinal level of the nervous system localising impulses run in different tracts from those of position or tactile discrimination; they are, on the other hand, intimately associated with tactile sensibility, for whenever there is defective localising power there is always reduction of tactile sense.

Summary.—The impulses conveying the sense of position and movement and of tactile discrimination pass up the same side of the cord; but since in cortical and subcortical lesions they are affected on the opposite side of the body, it is to be inferred that they cross in the medulla, and therefore all afferent impulses reach the side of the nervous system opposite to their point of entry. Of all afferent impulses entering the cord only the two uncrossed ones (position and tactile discrimination) show no signs of recombination—*i.e.* they remain of the peripheral type; the others—thermal, painful, and tactile—whether they arise from the epicritic, protopathic, or deep system, are recombined in the cord, and thus attain the *second sensory level.* The uncrossed, unrecombined impulses run up in the direct continuation of the posterior roots, namely, the long extrinsic fibres of the posterior columns, and do not cross until they reach the nucleus gracilis and the nucleus corneatus. Pain, heat, and cold impulses cross rapidly—in the space of five or six segments; tactile impulses more gradually. It results from this arrangement that the only definite consequence of disease of the posterior columns is loss of tactile discrimination and sense of position on the side of the lesion. One reason for the delay in the crossing of these impulses may be found in their character. Many impulses connected with equilibration, the maintenance of muscle tone, etc., never reach consciousness. Possibly the uncrossed fibres may convey these as well as those conveying the sense of position to the cerebral cortex. The former ("subconscious") set pass directly up in the cerebellar tract, and never cross at all, as the latter ultimately do. Head ends his long and valuable paper by saying that just as the grouping of peripheral (primary) sensory impulses undergoes reconstitution at the secondary (cord) level, so these secondary groups undergo further reconstitution at a tertiary (cerebral) level; and he promises a future contribution on the subject. It would be wrong to conclude this abstract without saying that every statement in Head's paper is proved by clinical observation, and that its pages contain detailed accounts of cases supporting his view. It is a wonderful example of what the comparative method in clinical medicine can accomplish in a most obscure branch of physiology.

SURGERY.

UNDER THE CHARGE OF

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Plastic Resection of the Mammary Gland.

A modification and extension of the operation devised by Gaillard Thomas, in 1882, is described by J. Collins Warren (*Ann. Surg.*, Phila., 1907, June), who urges that it should take the place of the incision made on the surface of the breast, not only for the removal of innocent tumours, but also for exploratory purposes. Warren carries an incision along the outer edge of the breast, so as to expose the outer border of the pectoralis major muscle. The breast, enclosed in the superficial pectoral fascia, is then raised up from the deep pectoral fascia covering the muscle; the layer of loose connective tissue intervening between them enables this to be easily and rapidly accomplished. With the left hand the breast is folded upon itself in such a way that the whole of its posterior aspect is exposed. It is then possible to identify the position of any cystic or solid neoplasm in the gland, and when this has been done, the growth may be exposed by an incision radiating from the centre to the periphery of the gland. To remove the growth, two radiating incisions are made so as to include a V-shaped segment of tissue which includes the tumour. The incision should extend to the loose supramammary fat, but not further, as the removal of the fat is followed by puckering of the surface of the breast and consequent deformity. It is never advisable to attempt to dissect out the tumour, as very few growths are capable of being "shelled out," and the attempt to do so involves needless laceration of surrounding tissues. It is much better to cut out a wedge of breast tissue including the growth. The V-shaped wound is then closed by two rows of buried catgut sutures, so that no space is left in the substance of the breast, and no depression forms on its surface.

The gland is now released from the hand of the operator and dropped back on to the pectoral muscle, where it is anchored to the outer edge of the fascia by a few catgut sutures. Another row of buried sutures may be passed through the subcutaneous adipose tissue before the skin wound is closed.

When operating for cystic disease of the breast, it is usually found that the larger cysts are grouped together in one area of the gland, and that they can all be included in one wedge-shaped segment. There are often, however, numerous smaller cysts scattered through the gland, and to expose these a number (3 to 8) of radiating incisions may have to be made. Cysts of the size of a pea can be snipped out with scissors; smaller cysts, if merely laid open, subsequently disappear. These linear incisions seldom require to be closed by buried sutures, as the edges fall together when the breast is replaced. However much the breast may have been incised, it is usually possible, by means of buried sutures, to build it up again so that its contour is but little interfered with; and although sulci or depressions may appear here and there when the sutures are tied up, these usually disappear as the sutures are absorbed. If the nipple is infolded or inverted, as is frequently the case, particularly in cystic disease, it may be made to project by carrying a buried purse-string suture around its base.

When this operation is performed for exploratory purposes, to settle a doubtful diagnosis, the incision should be carried further along the axillary border, to diminish the risk of pressing cancer juice along the lymphatic channels. In such cases "the breast may be sliced almost as freely as a brain is at an autopsy, provided the radiating method is adopted, without danger of interfering with its vitality." If a malignant growth is discovered, the complete removal must, of course, be carried out at once.

The dressing should be applied so as to produce lateral compression of the lower and upper hemispheres, as the ordinary swathe tends to flatten out the gland and put a strain upon the buried sutures.

The advantages of this operation are the slight risk or discomfort to the patient, the short convalescence, and the absence of disfigurement. [The abstractor has frequently carried out this procedure, and can fully confirm the high opinion expressed of it by Collins Warren and Gaillard Thomas.]

ON THE ORIGIN OF ASEPTIC SUPPURATION.

BURKHARDT (*Centralbl. f. Chir.*, Leipzig, April 6, 1907) has carried out a series of experiments on animals to elucidate the means by which suppuration is produced by aseptic substances. The method he employed was similar to that used by Buchner in his observations on chemotaxis. The substances whose pyogenic capacities were to be tested were enclosed in small glass tubes, which were sealed and placed under the skin of the animal. At a later period the glass tube was broken, and after a few days the effects were investigated. In the crushed muscular tissue, pus, varying in quantity from one to three minims, was found; and in burnt muscular tissue a more powerful chemotactic influence was manifest. It would appear, therefore, that the crushing or burning of muscular and other tissues may give rise to aseptic suppuration; and it is probable that the pyogenic properties lie in the albuminous bodies which are liberated by the disintegration of cells and of their nuclei. The author experimented in the same way with chemically pure myosine, blood albumin, nuclein, fibrine ferment, and fibrinogen. It was observed that all the substances which produced chemotactic results were albuminous bodies, and, apart from these, there are very few chemical agents which have a similar action. The author experimented also with turpentine, which gave a strong chemotactic result in the dog but a less marked result in the rabbit; with nitrate of silver, which gave a slight reaction; and with ammonia and caustic potash, which were negative.

Slight rise of temperature (aseptic fever) was found to follow the injection of the juice of crushed muscle into rabbits.

THE REMOVAL OF STONE FROM THE URETER.

BARTLETT (*Centralbl. f. Chir.*, Leipzig, June 1, 1907) reports four cases in which he has removed calculi from the ureter by the following method. An incision is made at the outer border of the rectus, dividing all the structures of the parietes down to the peritoneum. The peritoneum is then displaced towards the middle line by blunt dissection. The ureter is so intimately connected with the peritoneum, and the peritoneum is so loosely attached to the fascia transversalis, that the ureter is easily brought to the wound by making traction on the peritoneum. Having been thus brought into the wound, the ureter is grasped between the thumb and fore finger, and its whole extent may then be palpated with the fingers of the other hand. When the stone is found, it is held between the finger and thumb so as to stretch the wall, and with a sharp knife a small opening is made, through which the stone escapes. The opening in the ureter is not stitched, but a small rubber tube is passed down to the neighbourhood of the ureter and brought out at the lower corner of the wound, the rest of the wound being closed. There was never any urinous odour in any of the four cases so dealt with by Bartlett. The drain was removed on the fifth or sixth day, and the patients were able to leave hospital within two weeks of the operation.

ON THE TREATMENT OF ANKYLOSED JOINTS BY THE INTERPOSITION OF PLATES OF CARTILAGE.

WEGLOWSKI (*Centralbl. f. Chir.*, Leipzig, April 27, 1907) has succeeded in restoring mobility in an ankylosed elbow-joint by the following operation. After separating the soft parts together with the periosteum from the joint area, he removed, with a Gigli saw, the mass of bone corresponding to the epiphysis of the humerus, then portions of the ulna and radius, and all other superfluous portions of bone.

The next step consisted in exposing the cartilages of the sixth and seventh ribs, and raising up two plates of cartilage together with the perichondrium; the whole length of each cartilage was thus removed, but only half its thickness.

The two plates of cartilage thus obtained were then interposed between the fresh bony surfaces of the joint, with the perichondrium in contact with the humerus. They did not require to be stitched in position, as they were firmly held between the bony surfaces. The wound was then closed, and the limb put up in plaster. In ten days the plaster was taken off, and the stitches removed; and after this active and passive movements of the joint were carried out. At the end of a month the patient could bend his elbow to 60 or 70 degrees, and pronation and supination were normal.

Unfortunately, the patient died five weeks after the operation of pleuro-pneumonia. On examining the joint, it was found that the plates of cartilage with their perichondrium were firmly attached to the humerus, and the bony surfaces facing the cartilages were white and shining. The microscopical examination showed that new blood vessels had formed between the bone and the cartilage, and the connective tissue fibres of the bone were fused with those of the perichondrium. The cartilage was perfectly preserved, its cells and their nuclei staining well.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Complete Rupture of the Pregnant Uterus.

R. W. Lobenstine (*Bull. Lying-in Hosp.*, N.Y., vol. iii. No. 4) presents a study based on thirty-seven cases of complete rupture which have been observed in 41,800 labours at or near term. Complete rupture of the uterus may be either spontaneous or traumatic, and may only be large enough to admit the finger, or so extensive that the child is delivered into the free peritoneal cavity. The most frequent seat of rupture is the lower uterine zone, and the varieties are—(*a*) transverse, (*b*) longitudinal. Lobenstine finds that those varieties are usually more or less combined. Intra-uterine manipulations generally cause the latter, while spontaneous cases are generally of the transverse type. Rupture of the fundus is very rare, only one example being noted in the series. The etiological factors in the cases were as follows: Spontaneous rupture due to contracted pelvis, seventeen cases; rupture of a scar after cervical amputation, one case; traumatic from high forceps, two cases; internal podalic version, twelve cases; accouchement force, four cases; embryotomy, one case. The mortality in the thirty-seven cases under review was 73 per cent., twenty-three being treated by hysterectomy, with a mortality of 60 per cent., and fourteen with packing, with a mortality of 92 per cent. The author holds that cœliotomy should be done in all cases of complete rupture, except (*a*) clean cases with slight damage, where the bleeding can be controlled by packing, (*b*) very bad cases with marked shock. In the latter the child may be extracted from below when possible, and tampons applied till the patient's general condition improves sufficiently to permit of subsequent cœliotomy. Hysterectomy is the preferable operation in most cases, suture of the uterine wound being only possible in simple uncomplicated cases.

A STUDY OF 1446 PERSISTENT OCCIPITO-POSTERIOR CASES.

J. A. HARRAR (*Bull. Lying-in Hosp.*, N.Y., vol. iii. No. 4) found 1446 cases of persistent occipito-posterior in 41,000 observed labours at or near full time. Of those, 1013 terminated spontaneously, while 433 required assistance as follows:—Manual correction of the position, 25 cases; forceps, 286 cases; version, 100 cases; craniotomy, 22 cases. The ratio of right to left posterior positions was 18 : 1 in the cases that rotate spontaneously during labour, while in persistent cases the ratio is 4 : 1. This shows that the occiput in the right posterior position is more likely to rotate anteriorly than in the left. The membranes rupture in the first stage in one-fifth of normal vertex cases, while in persistent occipito-posterior cases they do so in one-half of the cases. The perineum is no oftener lacerated than in anterior cases, unless the head is pulled through the pelvis with forceps with the occiput posterior. The maternal mortality is not increased. The fœtal mortality was 9 per cent. High forceps with head arrested at the brim gave better results than version. With the head in the pelvis the best treatment was found to be manual rotation, followed by forceps. In performing manual rotation, great importance is laid on external manipulation of the child's body assisting internal rotation of the head. Two signs point to failure of rotation—(*a*) delay in the advance of the head with strong pains, (*b*) regular advance of the head with gradually increasing extension.

THE OCCURRENCE OF SUBCUTANEOUS EMPHYSEMA IN LABOUR.

G. W. KOSMAK (*Bull. Lying-in Hosp.*, N.Y., vol. iii. No. 4) reports a case where this accident occurred, and reviews the literature on the subject. It is rare, and one writer places its frequency as one in two thousand cases. The etiology is still uncertain, as there are no direct anatomical findings available. Kosmak's case was a primipara of 16, whose pregnancy had been normal. The soft parts were, however, very rigid. The occiput was posterior, but rotated. Although pains were strong, the advance of the head was slow, and forceps were applied. The emphysema was not observed till some two hours before delivery, when a slight swelling appeared at the angle of the jaw. At the end of labour the emphysematous area had extended over both cheeks, neck, chest, and shoulders, and over the greater part of the face. The condition began to disappear on the following day, and by the ninth day had entirely gone.

An analysis of the seventy-seven cases collected from the literature shows that this accident occurs almost exclusively in primiparæ, and usually in young subjects. With few exceptions, the labours were prolonged from early rupture of the membranes, rigid soft parts, or contracted pelvis. The emphysema may come on during or after labour, but usually during an expulsive effort, when the swelling appears on the neck or face, accompanied at times by a sense of discomfort or dyspnœa. The mucous membrane of the mouth may also be injured, leading to the theory that the air might have entered through a wound produced by the teeth. The prognosis is good, and recurrence during subsequent labours unlikely. The treatment is symptomatic and expectant.

TORSION OF A GRAVID FIBROID UTERUS.

IVANOFF (*Compt. rend. Soc. d'obst., gynéc., et de pædiat. de Paris*, 1907, March) reports the following case:—P., æt. 24, married seven months, was admitted to hospital for acute abdominal pain. She had noted the presence of an abdominal tumour for seven years, and for three weeks before admission it had increased rapidly in size. There was a history of two months' amenorrhœa. The tumour, which caused dyspnœa and severe pain, extended upwards to the epigastrium and downwards into the pouch of Douglas. Torsion of an ovarian cyst with pregnancy was diagnosed. At the operation, however, both ovaries were found normal, and the tumour, which consisted of a fibroid uterus, twisted on the cervix. The uterus contained a three months' fœtus, and the entire tumour weighed 15 lb. The patient suffered greatly from shock, and died on the fifth day.

THERAPEUTICS.

UNDER THE CHARGE OF

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NOVASPIRIN.

UNDER this name a new form of salicylic acid has been introduced. It is a modified form of aspirin. In aspirin the salicylic acid is combined with acetic acid as the acetyl salicylic acid. In novaspirin the salicylic acid is combined with methylene citric acid as the disalicylic acid ester of methylene citric acid. It is a powder of slight but not unpleasant taste. It is insoluble in water, but dissolves in alcohol and chloroform. Owing to its insolubility it is not absorbed from the stomach, but in contact with alkalies it readily splits up into its component parts.

The action of the drug has been tested by various authors, who agree that it corresponds closely to that of aspirin.

Witthauer (*Berl. klin. Wchnschr.*, 1907, No. 3), using large doses, found that these caused no irritation, even in cases of marked gastric hyperacidity. The new drug has the tendency to produce secreting, and on the whole the general action seems less marked than that of aspirin both in a pharmacological and therapeutical sense. Consequently, somewhat larger doses of the new preparations are required, and up to 75 grs. in the day may be given safely. Its effect in influenza is very marked, but as a means of reducing temperature or for relieving neuralgic pains, it is somewhat less active than the other salicyl preparations.

Ruhemann (*Med. Klin.*, Berlin, 1907, No. 5) has studied very carefully the absorption and excretion of the new drug. He finds that it is much more slowly absorbed than aspirin, which is shown by the comparatively long period (one and a half hours) that elapses before the salicylic reaction can be obtained in the urine. On the other hand, the excretion is much more gradual, and takes from two to three times longer than with aspirin. After 10-grain doses of novaspirin, the excretion continued for from forty-eight to seventy-two hours, and the urinary reaction was at its height twenty-two to forty-eight hours after taking the dose, whereas with aspirin this stage was reached in two to five hours, and the whole of the dose was excreted in twenty-two to twenty-seven hours. This delay in excretion probably depends on a very slow breaking up of the drug in the bodily tissues and fluids, and not simply upon its insolubility, since salol, an equally insoluble drug, is much more rapidly excreted. Corresponding to this slow excretion, the pain-relieving action of novaspirin takes longer to become manifest, but compared with aspirin it lasts much longer. He agrees with Witthauer that the new drug causes less marked secreting, while it does not irritate the kidneys, depress the heart, or upset the digestion even after prolonged administration. The milder action enables it to be used in the treatment of children, and the absence of ringing in the ears permits the use of novaspirin in diseased conditions of the ears.

The report of Liebman (*Wien. klin. Wchnschr.*, 1907, No. 7) finds novaspirin almost as powerful as aspirin, and he considers it a perfect substitute for aspirin in rheumatic cases. It has no superiority in cases of neuralgia, but is almost a specific for influenza.

Reichmann (*Aertzl. Prax.*, Würzburg, 1907, No. 7), while praising the non-irritating properties of the drug in the stomach, states that it is less markedly antipyretic in rheumatic fever. Its action is less powerful than that of aspirin, but it is a useful preparation to use in milder forms of rheumatic and neuralgic pains.

Lehmann (*Deutsche med. Wchnschr.*, Leipzig, 1907, No. 10) comes to the conclusion that novaspirin exerts its specific action less rapidly than aspirin, but the action lasts longer. It is more pleasant in taste, and is better borne by the alimentary tract. Its action is principally exerted in calming the nerves and lessening pain, and for these purposes it can be very usefully employed in dysmenorrhœa.

Lastly, Floret (*Deutsche Med.-Ztg.*, Berlin, 1907, No. 17) found it useful in gout in doses of 30 grs. three or four times daily.

ANTIDOTES FOR LYSOL.

OWING to the facility with which it could be obtained, lysol poisoning with suicidal intent had become extremity prevalent in Germany. The experiences of the Charité hospital in Berlin has shown that washing out of the stomach is eminently successful if this treatment is carried out within a short time of swallowing the poison. Cases in which the washing out is imperfectly carried out, or performed at too long an interval after swallowing the drug, do badly. Friedlander has investigated what is the most suitable kind of antidote to administer in cases where it is impossible to remove the contents of the stomach. Experimenting with rabbits, he found that the toxic dose is 2·5 c.c. per kilogram of body weight. The action of lysol depends on the large quantity of soluble cresol which it contains. Cresol possesses a powerful affinity for fats and oils, and he finds that olive oil or other fats, as melted butter and lard, are able to preserve the life of an animal poisoned with this lethal dose if the fat is administered before the onset of convulsions. The same thing holds true for egg albumin. Animals treated in this way do not develop any convulsions. Even if convulsions have come on, the subsequent administration of an oily fluid soon checks the convulsions, and the animals recover, and in many instances convulsions cease altogether. Of course if a fatal dose of cresol has already been absorbed, the antidotal action is ineffectual. If only a small quantity of the antidote is given, the animals recover at the time but die in the course of the next four days; but if the antidote be given in the proportion of one-sixth of the lysol, the animal recovers completely and suffers no ill-effects. The nature of this antagonism has not yet been completely cleared up. If lysol be mixed with egg albumin the albumin is immediately precipitated partly in flakes and partly as a yellow slimey mass. Both these forms are completely dissolved by peptic digestion in twenty-four hours. Lysol mixed with oil and an acid-pepsin solution forms an emulsion. The excretion of urinary cresols in an animal treated with oil or albumin remains abnormally high for several weeks thereafter. Whereas after a non-lethal dose of lysol without any subsequent administration of oil, the excretion of cresols ceases within eight days. Friedlander suggests as the result of his experiments, that the best form of treatment of lysol poisoning consists in the thorough and immediate washing out of the stomach; but as part of the cresol is subsequently re-excreted into the stomach, the best plan is to administer some egg albumin or oil after the washing out is completed. Further, in all cases where from any reason it is impossible to wash out the stomach, the best hope lies in administering large quantities of albumin or oil. A knowledge of this fact among lay persons would enable them to minimise the risk of absorption during the time that elapses before a doctor can be obtained.—*Berl. klin. Wchnschr.*, 1907, No. 17.

MESENTERIC GLANDS OF THE SHEEP IN SCLERODERMA.

SCHWERDT reports a series of five cases of scleroderma in which he employed cœliacin, a preparation of dried mesenteric gland of the sheep. The result was successful in those cases in which the treatment was kept up for prolonged periods. In one case the improvement has been permanent for sixteen months after all treatment has been stopped. To judge from the clinical reports, the treatment requires to be kept up for a very long time. In the most successful case, the treatment was kept up for nineteen months. In another case, after two years' constant treatment, the skin became soft, and was no longer adherent to the underlying structures, so that it can be lifted up into folds and moved about.—*München. med. Wchnschr.*, 1907, No. 25.

THE TREATMENT OF ASTHMA WITH IODINE PREPARATIONS.

TAUSZK strongly recommends the use of iodides in the treatment of asthma. He recognises two clinical types of the disease. In the one form the daily administration of small quantities up to 15 grs. is sufficient to prevent the onset of paroxysms. In another type of case a very prolonged course of treatment is required, as all that is obtained at first is lessening of the number and severity of the paroxysms, which gradually cease altogether. Such cases show almost no improvement with small doses of 15 to 25 grs. of iodide daily, but respond well to large doses of 60 grs. the day. In cases where these larger doses cause distressing symptoms of iodism, he recommends the use of sajiodin, an organic compound in which the iodine is combined with a fatty acid. This preparation is better borne by the gastro-intestinal tract, and is less likely to produce iodism. He emphasises the fact that it is by no means an absolute preventative of iodism, but it is much less liable to induce it than the ordinary iodide salts, and the symptoms induced by its administration are on the whole of a much less serious character. The dose he finds useful for asthma is about 45 to 60 grs. daily.—*Wien. med. Presse*, 1907, No. 6.

INSANITY

UNDER THE CHARGE OF

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EAR AND THROAT DISEASE IN THE INSANE.

A SHORT paper by Dr. W. S. Bryant (*Med. Rec.*, N.Y., 1906, August 25) has been written on this subject. 161 cases in Manhattan Hospital were examined in this special relation; 134 had hallucinations of hearing, and 120 of these had ear disease. Of the remaining twenty-seven without hallucinations, only two had no ear disease. Particulars are given of several cases with special reference to the effect of treatment of the local disease upon the mental symptoms. The conclusions drawn by the author from his experience are that aural and naso-pharyngeal disease are exceedingly common amongst the insane, and that sometimes hallucinations of hearing appear to be excited by subjective sensations. A small number of these, less than 4 per cent. of the 161, were distinctly improved by treatment; and in certain of them, where the mental and local disease seemed closely related, the results were exceedingly good, the one being cured by attention to the other.

HYPOCHONDRIACAL MELANCHOLIA IN RUSSIAN SOLDIERS.

DR. SOUKHANOFF has recorded (*Journ. Abnormal Psychol.*, 1906, August) his experience of mental disease as it occurred in the soldiers of the Russian Army during the late war, so far as they came under his observation at Moscow. He found that hypochondriacal melancholia was remarkably common. This coincides with earlier experience, that mental affections occurring in soldiers are, in the main, not typical. Depression is much more often met with than excitement, and, according to Soukhanoff, hypochondriacal melancholia has been more common in his experience than the other varieties. The patients presenting this form of disease were not young, but were reservists who had already passed through their ordinary military training. In the second place, they had all been engaged in actual warfare, some of them having also been wounded. It is, of course, as the author points out, impossible to say that if these men had not been called up and gone to the front they would not have become ill. He is also unable to say, from his own experience, whether hypochondriacal melancholia is at all prevalent among soldiers during peace. Statistics on this head would have thrown some light on the influence played by war in producing it. He further observed that in his cases the original intellectual development was poor, and that the attack was the first that had manifested itself. The duration of the disease varied, as also did the ultimate result, some being cured and others not. It is doubtful what influence was exerted by the geographical position of the seat of war.

THE CYTOLOGICAL EXAMINATION OF THE BLOOD IN PSYCHOSES.

THE thorough examination of the corpuscular elements of the blood is now almost a routine practice in many hospital clinics, and is acknowledged to be of great interest and importance in many diseases. Dr. Lewis Bruce has already investigated this question in cases of insanity; and a recent paper by Dr. Burger (*Arch. méd. belges*, Bruxelles, 1907, January) gives further statistics in relation to ten cases of dementia præcox. The technique is first described, but most interest attaches to his results. These are not quite uniform, some of the cases showing a much greater departure from the normal than others. In about half the cases there is a quite distinct leucocytosis, and in these the lymphocytes and eosinophiles are most decidedly above the normal. In the others, divergences from the normal affect various of the white corpuscular elements, and no correlation is traceable between these variations and the mental state. In one case of a settled and chronic character the figures are almost normal, the only change observed being a distinct increase in the number of eosinophile elements. His conclusions are therefore meagre, but he promises a wider and more prolonged and extended examination. His results will be awaited with interest.

LUMBAR PUNCTURE IN THE TREATMENT OF EPILEPSY.

DRS. RICHENOL and Castin describe (*L'Encéphale*, 1907, January) their experience of lumbar puncture in a case of severe epilepsy, which more than once threatened to end in death in the status epilepticus. They give a very precise table of the fits which occurred each hour for nearly a month, and the effects of lumbar puncture can be seen on each of the five occasions on which it was employed. The subdural tension on all occasions except the last was exceedingly high. About 20 c.c. were withdrawn each time. The character of the fluid was examined after each puncture, but showed no special features. The temperature was never very high. From the table it appears that the relief of subdural tension and withdrawal of fluid was attended by at least temporary good results.

TRAUMATIC INSANITY.

DR. **MARIE** has written an interesting article on this subject (*Arch. de Neurol.*, Paris, 1906, April and May), which has now considerable practical importance, in view of recent legislation instituting compulsory compensation for accidents. It is no uncommon thing now for an alienist to be called upon to express a definite opinion on the relation of an accident to a subsequent attack of mental disease, and it is therefore necessary to have as clear ideas upon this point as present knowledge can make them.

In the first place, Marie considers it necessary to distinguish two classes of cases—those in which mental symptoms appear in persons with some latent cerebral weakness, the accident merely revealing them, and those in which the psychosis is produced wholly by the accident. The latter are the only true cases of traumatic insanity. In deciding to which of these a specific case must be referred, several considerations have to be taken into account. The nature and circumstances of the accident, the characters of the psychosis manifested, the date of its appearance, the examination of the patient with special reference to the existence of degenerative stigmata, and the personal, especially the hereditary, antecedents of the patient, must all be carefully considered. As regards the accident itself, there are cases in which this is followed by easily recognisable nervous symptoms, which permit of definite localisation of cerebral injury. In them there is no difficulty. It is, however, otherwise with those in which the only nervous symptoms are mental. These are the cases which are brought into court, and which consequently require the most careful study.

The psychosis may appear early or late. In the former case, the attack is usually transitory. These also present little difficulty. In the latter the relationship is surrounded by a considerable measure of doubt. Marie finds no special features in the symptomatology of such cases. He relates several where an apparently slight injury was followed by mental symptoms ending in dementia, this result, so far as could be judged, being due to the accident. The severity of the injury is therefore apparently no guide to the decision of cause and effect.

The examination of the patient is of special importance. Care must be exercised to ascertain the existence or absence of any mental symptoms before the accident. This is particularly so in cases of general paralysis and epilepsy, as patients affected with these diseases are specially prone to suffer from accidents. The patient's personal antecedents must be investigated to estimate the effect of toxic or hereditary influences. Syphilis and alcoholism are of prime importance in this relation. With respect to the influence of traumatism on hereditary defect, and the assessment of the value of each in the production of insanity, two questions have to be answered. Does the patient show any defect, and is the insanity the consequence of the accident or of the defect? The first is usually easily answered. The second is more difficult, and is really the crux of the whole question in most cases. Unfortunately, Dr. Marie does not give much assistance in settling it. Each case, he says, has to be decided on its own merits, and no general rules can be given which will apply to all. One point ought, however, to be capable of definite settlement—the length of time between an accident and the appearance of mental symptoms due to it. The collection of statistics on this point would go some way at least to clear up one aspect of this very difficult subject.

Cerebral Traumatism and Mental Disease.

Another contribution to this question, in addition to that cited above, is made by Professor Joffroy (*L'Encéphale*, 1907, February), who relates a case of dementia præcox which followed a not very severe fall. The case is first described, and it is made the text for a discussion, more particularly of the relation of traumatism to general paralysis. The conclusion arrived at is that there are a number of cases of cranial injury which give rise to general paralysis, but to establish the connection certain conditions must be fulfilled. There must have been no symptoms, physical or mental, before the accident to indicate general paralysis. A certain time—some months, or one to two years—must elapse after the accident before the manifestation of symptoms of general paralysis. Further, after a favourable evolution of the disturbances due to the accident, there must be established a persistence of certain cerebral symptoms growing out of the primary phenomena of the traumatism, and uniting these to the mental disease ultimately supervening. The same conditions must be applied to all forms of insanity which may manifest themselves after a cranial injury.

DISEASES OF THE EAR, NOSE, AND THROAT.

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Contributions to the Study of Hay Fever.

Although the literature of hay fever is constantly receiving fresh additions, it cannot be said that any specially valuable line of therapy has been brought to the notice of the profession since the introduction of Dunbar's antitoxin treatment. Heymann has recently called attention to the use of the thyroid gland preparations in the treatment of hay fever (*Arch. internat. de laryngol., etc.*, Paris, 1907, May–June). He has treated a number of patients in this way; he has made altogether twenty-one observations. In five, out of eighteen of these, he noted a moderate degree of hypertrophy of the thyroid, but in no case was there any evidence of a goitre demanding surgical interference. In the whole series of twenty-one cases there was no reason to doubt that the diagnosis of hay fever was a correct one. The patients had been affected for years, and knew their symptoms, and associated the pollen as the causal factor.

Of the twenty-one cases, two must be put out of consideration, as Heymann had not again seen them. In the remaining nineteen, the results of treatment were genuine, and they may be grouped in the following way:—In three cases in which treatment was commenced some time prior to the onset of the seasonal symptoms, the latter remained in abeyance. In addition to the administration of thyroid, the patients were advised to sleep with the windows of their rooms closed, to go outside as little as possible, especially in bright sunshine, and to avoid travelling by rail. The three patients referred to did not require to use pollantin serum during the previous hay fever season. One of them, who had suffered for thirty years from hay fever and asthma, had had no attacks; another had been able to walk through the fields without discomfort, in a way she had been unable to do for twenty years. While the third, an officer, who had previously been obliged to ask for temporary leave during the summer manœuvres, was able to attend to his duties. Of the sixteen others who had been benefited, twelve attributed the improvement to the thyroid treatment, while four were inclined to credit the lower temperature and damper atmosphere with the amelioration of their symptoms. The dose given was from one to three tabloids daily. In no case was any poisonous symptom produced. Heymann considers that the results which he has so far obtained warrant him in making further trial with this line of therapy.

Killian has recently drawn attention to the susceptible areas of the nasal mucous membrane, the treatment of which he regards as very necessary in cases of hay fever (*Laryngoscope*, St. Louis, 1907, May). The mucous membrane of the nose may become hyperæsthetic without definite manifestations of inflammation, and the hyperæsthesia is produced by certain forms of irritation, which may be purely mechanical, or which may have an additional chemical reaction. It is the anterior part of the nasal chamber which comes more directly under the influence of aerial irritation, and Killian from his experience has come to the conclusion that in each chamber there are two areas of special hypersensitiveness, one being lateral and the other median in position. By the use of the probe these two spots can be localised, but the patients themselves can frequently draw the physician's attention to their situation. The lateral area lies slightly above the anterior end of the middle turbinated body, while the mesial one is placed upon the upper part of the septum above the tubercle. These areas lie in the distribution of the first division of the fifth cranial nerve. The irritation, however, arising in these areas may extend to other nerve areas, such as the distribution of the vagus, the stimulation of which may result in an attack of asthma.

Treatment should be local and general. In the former, attention must be paid to the removal of all the causes which excite hyperæsthesia of the mucous membrane, and the elimination of the reflexes, as well as of predisposing causes in the interior of the nose. Amongst such predisposing causes may be mentioned, thickened and deflected septa, swelling and hypertrophy of the turbinateds, nasal polypi, and accessory sinus suppuration. The point, however, to which Killian draws special attention is the elimination of the hyper-sensitive areas upon the mucosa. He is convinced of the necessity of cauterising all the points of irritation at one sitting. These are, as already indicated, four in number, the two median or septal, and the two lateral or turbinal. He favours the use of trichloracetic acid, which he applies to the spots after preliminary cocainisation. It is best applied with a small cotton-tipped applicator, care being taken to keep it circumscribed, as the acid diffuses itself very quickly. The cauterised surface in each situation is less than ¼ in. in diameter. In the majority of cases results are at once noticeable, but in others improvement is delayed. In some the palliative effect is undoubted; in others there is complete cure. The result, however, is seldom permanent, recauterisation being necessary.

Opinions expressed regarding the value of pollantin in the treatment of hay fever are variable. Avellis (*München. med. Wchnschr.*, 1907, No. 11) has observed that patients who praised it highly the first year, were far from satisfied the second year, while in the third year of its use they thought that its application actually rendered the mucous membrane of the nose more sensitive. Wolff-Eisner, who tested the use of pollantin upon a number of patients, came to the conclusion that the serum was altogether devoid of any reliable therapeutic activity, and that even where employed as a prophylactic it was powerless to prevent the onset of an attack of hay fever. In 47 per cent. of the cases pollantin was without any action, and in 50 per cent. some alleviation was observed. In experimenting with pollantin, great care must be taken that all the cases in which it is employed are genuine cases of hay fever, and that they are not cases of vasomotor coryza. In our experience distinct benefit results from the application of pollantin to the conjunctiva in hay fever, the itchiness and the injection of the vessels being very rapidly allayed.

Schadle (*Med. Rec.*, N.Y., 1907, May 25) contributes a long paper upon the antrum of Highmore as an etiological factor in the production of hay fever, and quotes a number of cases in which treatment applied to that sinus exerted an important remedial influence upon the vasomotor attacks. This relation is not discussed for the first time, as other writers have drawn attention to the antrum of Highmore in similar cases, and to a pathological condition of its interior as being an etiological factor in the production of hay fever. During a period of three years, Schadle had under his observation ninety-one cases of hay fever and rose cold. We have no intention of following the writer through the detailed account of some of his cases, nor do we pass any criticism upon the views enunciated in the paper, but confine ourselves to quoting the statements which he makes in his general remarks and deductions. All the cases were apparently treated by washing out the antrum. In one only did the treatment totally fail, in spite of thorough trial. In three there was no response, for lack of adequate treatment. There were twelve entirely relieved within a period of two and a half weeks, —patients who had suffered in former years for six to eight weeks each season,—while the remainder were fully and completely relieved of symptoms in a week or ten days, and, in exceptional instances, even in four days. The condition of the antrum in these cases is one of a chronic catarrhal inflammation, and the writer asks the question whether treatment may not be productive of immunity by carrying it out during the intervals between hay fever seasons. In the presentation of his report the writer does not wish to overestimate his observations or to appear too enthusiastic, but he merely wishes to emphasise the fact that the antral theory of hay fever and asthma has a basis for existence and recognition.

Meningitis following Intranasal Operations.

The possibility of a fatal meningitis ensuing upon a minor intranasal operation, when there is pus present in the nasal cavity, should not be lost sight of. Cases of this kind are from time to time recorded, and quite recently two such cases are described in the same journal (*Boston Med. and S. Journ.*, 1907, May 30). The first is recorded by Mosher, who removed the anterior end of the left middle turbinated bone from a man æt. 50, whose middle meatus contained a quantity of pus. After the operation the nose was packed with sterile gauze, which was, however, removed on the following morning. Within twenty-four hours of the operation the patient complained of frontal headache, and shortly afterwards he became irrational. On the second day after the operation he had the symptoms of septic meningitis. The maxillary antrum, ethmoid cells, and sphenoidal sinus were opened, but the patient never regained consciousness.

The second case is recorded by Tobey. The patient was an adult male affected with nasal polypi and suppuration in the ethmoidal and sphenoidal sinuses on both sides of the nose. A number of intranasal operations were performed at short intervals. Finally, some polypoid tissue, which was lying bathed in pus in the left ethmoidal region, was removed. Twenty-four hours later, symptoms of septic meningitis supervened, and the patient died four days later.

There is little doubt that, in the first of these two cases, the meningitis was determined by the gauze packing used after the operation upon the middle turbinated bone. In this way the pus was retained, and the infection of the meningitis was in consequence favoured. Plugging the nasal cavities in the presence of pus is a procedure fraught with risk, and it is better avoided. If there is risk of hæmorrhage in these cases, it is wiser to put the patient to bed or to keep him very quiet, so that there may be no need for packing.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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The Action of Wine on Typhoid Bacillus.

Sabrazès and Marcandier (*Ann. de l'Inst. Pasteur*, Paris, tome xxi. No. 4), in a most interesting paper point out the varying bactericidal action of different kinds of wine, old and new, on the bacillus of typhoid fever. They first experimented with *vin ordinaire* from the Gironde district, bottled on the day of experiment, and containing 9·1 per cent. of alcohol, and having an acidity, expressed as sulphuric acid, of 4·9 per cent. This wine, which was not sterile, was made so by passing through a Chamberland filter. When 2 drops of a bouillon culture of *B. typhosus* was added to 10 c.c. of the pure wine, the typhoid bacilli were killed in two hours at a temperature of 17° to 18° C., and the same result was attained in four hours if 5 drops instead of 2 drops of the culture were added. A white wine of Cérons (1890), ten years in bottle, similarly filtered, containing 10·7 per cent. of alcohol, and with acidity of 5 per cent., tested in the same way, killed *B. typhosus* in less than an hour with the temperature at 17° to 18° C. Dry champagne (Epernay), containing 9·7 per cent. of alcohol, and having an acidity of 5 per cent., which had been several years in bottle, and a red Bordeaux wine (St. Estèphe, vintage 1888), were next experimented with. Both of these wines were proved to be sterile on opening. The champagne killed the typhoid bacilli in less than ten minutes, while in the Bordeaux wine they were still alive after thirty minutes. From their experiments they found that wines kept long in bottle are sterile when sown in nutrient broth or on nutrient agar and incubated, while red wines drawn daily from the cask contain bacteria and moulds which grow readily in these media. Pure wines have a powerful bactericidal action on *B. typhosus*, but the intensity of this action depends on the nature and quality of the wine. White wines are more active than red wines. The following abridged table shows broadly their results :—

Nature of the Wine.	Year.	Acidity as Sulphuric Acid.	Alcohol.	Death of *B. Typhosus*.
		Per cent.	Per cent.	
Champagne (dry) . .	Several years in bottle	5·78	9·7	Less than 10 minutes.
Sadirac (white) . . .	1903	5·3	8·2	,, 15 ,,
Cérons (white) . . .	1890	5·0	10·7	20 minutes.
Grenache	1892	4·06	15·3	Less than 30 minutes.
Beaune (red) . . .	1898	5·45	10·5	,, 30 ,,
St. Estèphe (red) . .	1888	4·16	8·5	,, 2 hours.
Carignan (red) (*vin ordinaire*)	new	4·9	9·1	,, 3 ,,
Sadirac (white) (*neutralised*)	1903	0·0	8·2	Alive at end of 6¼ hours.

Acidity plays an important part, as is seen in the case of the Sadirac wine, which killed the *B. typhosus* in less than fifteen minutes. This same wine when neutralised failed to kill the bacilli in six and a half hours, and took several days to kill them when it was diluted with an equal bulk of water. The higher acidity of white wines, as seen from the table, explains their superior bactericidal action. These wines contain a relatively large amount of sulphurous acid, which also probably largely contributes to their bactericidal activity. The amount of the sulphurous acid varies from 10 to 15 mgrms. per litre, and occasionally reaches 100 to 130 mgrms. per litre. The white wine (Sadirac) used in the experiments contained 123 mgrms. per litre. It was a young wine, having been only a few days in bottle. In older wines the amount decreases with age. The amount of alcohol present in the wines has but little influence. Dilution diminishes considerably the antiseptic action. The number of micro-organisms introduced into the beverages considerably influences the time of sterilisation. Common red wine, with 2 drops of culture added, killed the bacilli in two hours, but 5 drops of the same culture required nine hours for sterilisation. Temperature is also of importance. At 37° C. old St. Estèphe is more antiseptic than at 15° C. By making a mixture of equal parts of suspected water with wine six hours before use at a meal in the case of white wine, and twelve hours in the case of red wine, all danger could be averted. This could be done in the absence of boiling, filtration, or other means of purifying contaminated water. This practice of dilution, *ante cibum*, long in vogue in boarding-schools, etc., is thus plainly justified. In conclusion, the authors consider that bottled wines are capable of being used, in the absence of more suitable antiseptics, by surgeons and accoucheurs in urgent cases.

OYSTERS AND TYPHOID FEVER, ETC.

IN February last the Académie de Médicine appointed a commission, consisting of MM. Chantemesse, Chatin, Edmond Perrier, Vaillard, and Netter, to report as to the best practicable means for the prevention of accidents arising from the eating of oysters, and especially the occurrence of typhoid fever following the eating of oysters. The recommendations of this committee, which were submitted by Netter, as reporter, and which were unanimously adopted by the Académie, have for their object the collection of the oysters from waters protected from all contamination, direct and indirect, by fæcal matter, and the prevention of any subsequent contamination between the point of collection and the ultimate arrival of the oysters on the table of the consumer. The realisation of this scheme is easy with the collaboration of competent authorities. The Académie considers that an inquiry, topographical, chemical, and bacteriological, should be instituted by the proper authorities (the Maritime Board). To this inquiry should be submitted the condition of all oyster beds, breeding grounds, storage ponds, fattening ponds, etc. There should only be retained those beds whose salubrity shall be established by this inquiry, or in which the necessary measures demanded in the course of the inquiry for securing this salubrity have been carried out. The beds, etc., should be submitted to regular inspection. The laws interdicting the pollution of water-courses should be applied most rigorously to those municipalities in the neighbourhood of oyster-layings, etc. The dragging of natural oyster banks whose condition might be recognised as doubtful, should only be authorised at such times as there would be no reason to dread the sale of these oysters. They could be disposed of to those large concerns where the oysters are kept in their depôts for a sufficient time to ensure their purification before distribution. It will be equally necessary to watch the transport and sale of oysters to assure that no contamination is possible in the course of despatch or on the premises of the retailer, large or small. This surveillance of oysters ought to be as rigorously exercised, and by the same administration, as for all other articles of diet. The entrance of foreign oysters should be prohibited unless they come from beds subject and submitted to an analogous inspection to that which is demanded from the native beds, and only when they are provided with a certificate of origin.

Propagation of Infectious Diseases by the Fur of Cats and Dogs.

Dr. Remlinger, Director of the Pasteur Institute at Constantinople (*Rev. Scient.*, Paris, 1906, p. 801), draws attention to this subject, and gives the results of experiments carried out with the assistance of Osman Nourri on the survival of various micro-organisms on the hair of cats and dogs. That this is a means of spread of these diseases is too little recognised, and he quotes the case of two young girls who successively contracted scarlet fever in spite of the strictest precautions as to isolation and in preventing the possibility of intermediary contact. After strict inquiry as to the failure of this isolation in preventing the infection of the second girl, it was discovered that a very fine cat, to which no attention had been paid, had left the room where the elder sister was desquamating, and went to be caressed by the younger. This animal without doubt had been, by means of its fur, the carrier of the contagion from the sick to the healthy sister. With the assistance of Dr. Nourri, the author made some experiments by spreading on the hair of cats and dogs bouillon cultures of *B. typhosus*, *B. diphtheria*, *B. pyocyaneus*, and *B. anthrax*, and making cultures after varying times from cut hairs. They were able to demonstrate the presence of living *B. typhosus*, *B. diphtheria*, and *B. pyocyaneus* for as long as five days, and *B. anthrax* after the lapse of two months.

Thus animals admitted to the beds of sick persons, and caressed and embraced by convalescents, may harbour in their fur, or in the mucus of their lips and nose, the germs of the eruptive fevers, *B. diphtheria*, etc., which later they may convey to others from whom they demand evidences of affection. It is not only in families that dogs and cats are to be feared from the point of view of the propagation of infectious diseases. It would appear as if the danger was even more real in hospitals, sanatoria, asylums, etc. If dogs are scarce in such establishments, cats are almost always very numerous, going from bed to bed, ward to ward, and pavilion to pavilion. They are caressed by the patients, and are capable of becoming the source of inside cases. Dogs and cats ought to be ruthlessly banished from all hospitals and similar institutions. In private houses these animals ought never to be allowed to enter the rooms of persons suffering or convalescent from contagious diseases, and particularly from the eruptive fevers.

OBITUARY.

Dr. James Dunsmure, one of the most popular members of the medical profession in Edinburgh, died on the 16th ult., at the age of sixty-two. He was born and brought up in the atmosphere and surroundings in which his life was to be spent, and while still a young man he became physician to the Royal Hospital for Sick Children, and in his turn also President of the Royal College of Surgeons, like his father before him.

He was a man of sound judgment and sterling character, and was greatly beloved by his patients and colleagues, and his presence was always in great request at social gatherings. He acted as director on the boards of many of the charitable institutions of Edinburgh, and, in his own quiet and genial way, did a great deal of useful work amongst all classes of the community. His death leaves a great blank in Edinburgh medical circles, and the deepest and most heartfelt sympathy is universally felt for his only daughter.

By the death of Edward Hallaran Bennett, which took place at Dublin on 21st June, Ireland has lost one of her foremost exponents of surgery, and the medical profession one of its most esteemed members. During his long association with the University of Dublin, first as University Anatomist and later as Professor of Surgery, the name of E. H. Bennett stood for all that was best in Irish surgery. He was among the earliest of Lister's disciples, and is generally admitted to have been the first Irish surgeon to adopt his methods and to practise antiseptic surgery. Throughout his incumbency of the chair in Trinity College he was ever in the van of surgical progress, and all who studied under him bear testimony to their admiration for him as a surgeon and a teacher and their affection for him as a man.

One department of surgery he made peculiarly his own. The professional descendant of the great Calles; the pupil and intimate friend of R. W. Smith, and ultimately his successor in the chair of surgery; and the official custodian of the unique collection of specimens illustrating fractures and other injuries of bones, which makes the museum of Trinity College famous, inevitably had his attention directed to this important subject, and Bennett, by nature as well as by training, was admirably equipped to carry on the investigations of his famous predecessors. It is perhaps not too much to say that in his day no man had a more intimate knowledge of fractures, and that for many years he was the highest living authority on the subject. There lies before us as we write a collection of some of his published papers on fractures and allied subjects, and although by no means bulky, it contains a fund of sound, reliable, first-hand information, which renders it a valuable source of reference. The suggestiveness of his presidential address on "Typical Fractures," and the practical generalisations he makes; the lucidity of his description of the varieties of fracture of the lower end of the radius; the originality of his observations on fracture of the upper third of the fibula by indirect violence; and the trenchant criticisms of some of the current views on congenital dislocation of the hip, mark the master mind, and stamp these writings with the hall-mark of authority.

Perhaps the most original of his contributions to our knowledge of fractures was the description he published, in 1881, of the fracture of the base of the metacarpal of the thumb, now known as Bennett's fracture. This common, if somewhat obscure, lesion had till then been entirely overlooked, and it is a curious fact that, in spite of the clearness and completeness of Bennett's description, the subject received but scant attention for many years. With the introduction of the Röntgen rays, fresh interest was aroused in it—chiefly because it could be easily diagnosed—and it has now come to be recognised as one of the common injuries of the hand. It is a high tribute to the clinical acumen of Bennett that neither improved methods of diagnosis nor accumulated experience has added any single fact of importance to his original description of this lesion.

It is matter for sincere regret that Professor Bennett was never induced to write a systematic treatise on his favourite subject. We would fain hope that a complete collection of his contributions to the literature of fractures may soon be made. It would be a worthy memorial of the man, and would to some extent compensate us for the loss of much irrecoverable knowledge which has died with him.

We regret to have to record the death of Major David Macbeth Moir, of the Indian Medical Service, which occurred at Calcutta on 5th June from blood poisoning.

He was the eldest of the family of Dr. Moir of St. Andrews, and therefore grandson of "Delta," whose name he bore.

He graduated M.B., C.M., in Edinburgh in 1885, and afterwards filled the posts of Demonstrator of Anatomy under Sir William Turner, and was a resident in the Royal Infirmary, Chalmers' Hospital, Sick Children's Hospital, and Maternity Hospital. He distinguished himself at Netley, and in 1899 his thesis for M.D. received high commendation. Latterly he had held the position of Professor of Surgical and Descriptive Anatomy in the Medical College, Calcutta, and his untimely death has cut short a career of great promise, to the deep regret of his many friends at home and in India.

REPORTS OF THE MEDICAL SOCIETIES.

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EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—*July* 3, 1907.—Dr. J. O. **AFFLECK**, President, in the chair.—Drs. **FORD ROBERTSON** and **DOUGLAS M'RAE** showed—(1) Rats showing paresis resulting from the action of *Bacillus paralyticans brevis*; (2) microscopical preparations from cases of general paralysis, illustrating bacillary infection.—Dr. **DAWSON TURNER** showed—(1) A case of rodent ulcer refractory to the X-rays but amenable to radium; (2) a case of rodent ulcer treated by zinc electrolysis.—Dr. **LOGAN TURNER** showed—(1) Patients after operation for chronic suppuration in the frontal sinuses; (2) patient successfully treated by X-rays for lupus of the larynx.—Mr. J. W. **STRUTHERS** showed a case of trigeminal nævus with epilepsy and paresis of the arm and leg on the opposite side to the nævus.—Dr. **LOW** (for Dr. **NORMAN WALKER**) showed—(1) A case of mixed infection; (2) a case of bromide eruption; (3) a case of erythema multiforme; (4) a case of acne keloid.—Mr. **ALEXIS THOMSON** read a paper entitled "The Making of a Shelf below the unduly Mobile Kidney." The kidney is retained in the normal position by a sac derived from the fascia transversalis. This sac is firmly closed above and to the outer side, but is less firmly closed below and to the inner side. The prolapse of the organ is thus favoured when there is a tendency to this occurring. The principle of the operation was introduced in America some years ago, but apparently has not been adopted in Europe. It consists in replacing this kidney in the sac and firmly closing by catgut sutures the lower opening, thus forming a shelf on which the kidney rests. The operation has given very good results in America. Mr. Thomson gave notes of five cases he had operated on by this method during the past nine months. All the cases had done well. Referring to the cause of unduly mobile kidney, he suggested that possibly the loose attachment of the colon on the right side has to do with the great frequency of floating kidney on the right side as compared with the left, where the attachment of the colon is much firmer.—Drs. **FORD ROBERTSON** and **DOUGLAS M'RAE** read a paper on the "Treatment of Cases of General Paralysis and Tabes Dorsalis by Vaccines and Anti-Sera." They first treated their cases with vaccines, and found that injection was followed by an immediate rise of temperature, and later by improvement in the mental symptoms in many cases. Some cases, however, relapsed into their former state, and in some there was no improvement whatever. Vaccination method was then abandoned and anti-sera used instead. These anti-sera are prepared by injecting weighed quantities of bacilli into sheep every week till the sheep failed to react. The serum was then collected. The serum may be given by the mouth, per rectum, or hypodermically. The local effect of hypodermic injection is slight. Various general effects were observed—disturbance of digestion, rise of temperature and of pulse rate, and a marked improvement in the mental state. Some cases so far improved as to show practically no signs of general paralysis. Of twenty-six cases treated by this method, only two failed to show any improvement.—Dr. GEORGE M. ROBERTSON read a paper "On the Presence of a Bacillus (Muirhead's diphtheroid) in the Blood of Persons suffering from General Paralysis, and Observations on the *B. paralyticans*." The research was carried out by the staff of Stirling District Asylum, and their object was to confirm the definite conclusions arrived at by Dr. Ford Robertson in the Morison Lectures. The primary observations were restricted to cultures made from the blood and cerebro-spinal fluid of living general paralytics. The mucous surfaces were avoided owing to the recognised occurrence of diphtheroids in these regions in other conditions, and post-mortem results were treated as of secondary importance, owing to the tendency to ante-mortem invasion by micro-organisms and the rapid putrescence of those dying from general paralysis. The positive result of these researches was the finding in the blood of a bacillus of the xerosis group of diphtheroids, differing from the *B. paralyticans*. It has been named after the pathologist of the asylum to distinguish it from the *B. paralyticans*, and to avoid the assumption of any theory as to the part it plays in the etiology of general paralytics.

EDINBURGH OBSTETRICAL SOCIETY.—*July* 13, 1907.—Dr. J. W. BALLANTYNE, President, in the Chair.—Professor KYNOCH, Dundee, read a paper on "A Series of Five Cases of Cæsarean Section for Contracted Pelvis." He narrated the cases in detail, and then discussed the subject under three heads—(1) The methods of treating the uterus after delivery of the child; (2) the best time for operating; and (3) the prevention of hæmorrhage. One mother died, and Professor Kynoch thought this result was due to imperfect dilatation of the cervical canal, which led to imperfect drainage and sepsis.—Dr. LOCHHEAD read a paper "On the Carbohydrate Metabolism of the Fœtus," and gave the results of his recent experimental work on the function of the placenta.—The PRESIDENT's paper on "The Byrth of Mankynde: its Contents," was held as read.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Digestion of Milk.

AMONG the chief penalties of civilisation must be reckoned the progressive inability of womankind to suckle her offspring. And although medicine may find some means of hindering the loss of function, there is little doubt that for long she will be driven to seek the remedy in improving artificial feeding. Considering, therefore, the enormous importance of accurate information on the composition and digestion of cow's milk, the remarkable investigations now being carried on in America by Van Slyke and Hart ought to be more widely known than at present.

The outstanding fact of practical moment to the physician which emerges from their work is this, that when milk enters the stomach it automatically adjusts itself as regards digestibility to the gastric powers for the time being. In a stomach of feeble digestive capacity, milk is so dealt with as to tax function just to its limit and no more, while in a more active organ the same milk will demand a greater effort before it is digested. Milk, therefore, is the unique possessor among foodstuffs of the property of developing the growing gastric functions. A brief account of the changes it undergoes in digestion will make this clear.

Casein exists in milk as calcium paracasein, which is changed by rennin into a soft clot of calcium paracasein. Hydrochloric acid converts this, first, into free paracasein, and then, when in excess, into paracasein hydrochloride. These three—calcium paracasein, free paracasein, and paracasein hydrochloride—represent three progressive steps in the formation of solid curd, the first being soft and flocculent, the second firmer, and the third the dense, cheesy curd familiar to all. Now, the new-born infant's stomach secretes no hydrochloric acid, and only the soft rennet clot forms in it; this is not digested by pepsin in the absence of acid, but is expelled into the duodenum without further elaboration, the process serving to exercise the feeble motile power of the stomach wall. Later, as small quantities of hydrochloric acid appear, the soft coagulum is converted into a denser mixture of free paracasein with calcium paracasein, and a certain amount of peptic digestion is demanded. Finally, as the acid becomes abundant, the dense paracasein hydrochloride is produced, and peptic digestion is further stimulated.

This remarkable compensatory process suggests an explanation of the tolerance of healthy infants for pure cow's milk, and of the success attending Budin's method of feeding; it also explains the anomaly that occasionally a baby which cannot digest a weak milk mixture may be able to support a stronger one. For obviously, if the amount of casein be small relatively to the quantity of hydrochloric acid secreted, a dense curd will form, and by increasing the casein a less dense, though more bulky, curd will result. True, we are still in the dark as to any analogous adjustment in intestinal digestion, and further research on this is required. A further striking fact learned is the great solubility of casein in very dilute hydrochloric acid, a solution so weak as 0·002 per cent. having distinct solvent property at the body temperature.

Other of Van Slyke's observations show that our notions of the constitution of milk require modification. It has been proved that woman's milk, like that of the cow, is acid, not alkaline. Hence we must seek a new explanation of the indubitable benefit of adding alkalies in feeding infants. Apparently sodium bicarbonate, lime water, etc., do not merely delay the action of the gastric hydrochloric acid, but combine with casein, and deprive it of its property of being curdled by rennet. Prior to the appearance of hydrochloric acid in the stomach, accordingly, we can, by adding less or more alkali, provide a milk which will undergo little or no primary rennet digestion. The percentage composition of milk, too, seems so variable as to nullify any approach to exactitude in minutely calculated modifications based on an assumed average. For what they are worth, Van Slyke's figures, from 5500 analyses, are—Fat, 3·9; casein, 2·5; albumin, 0·7; sugar, 5·1: on the whole, then, approximating a little more closely to human milk than those usually given. More important, perhaps, is it that the ratio of casein to albumin is only about 3½ to 1, instead of 5 or 6 to 1, as currently stated,—this, too, being nearer the human average.

Valuable and suggestive as this work is, the experimenters themselves are the first to assert that much more must be done before the true nature of milk digestion is known. Without wishing to incur even a suspicion of encouraging rule-of-thumb methods, we venture to say that too much striving to regulate infant feeding on purely theoretical grounds is at present less likely to advance practice than clinical observation and experiment. This is a matter in which every practitioner might help. What we need are series of exactly recorded weight curves of healthy infants under various conditions, with precise details of the feeding adopted. After all, we wish to discover the best way of rearing the normal child. The pediatric physician's experience of these is necessarily less than of puny dyspeptic or wasted infants, and not a little of the current teaching on infant feeding is coloured by this experience.

Chloroform and its Risks.

Dr. Waller, President of the Section of Physiology, at the recent meeting of the British Association, devoted the greater part of his introductory address to the discussion of the best means of diminishing the dangers attending the administration of chloroform. To many the subject may seem somewhat trite and wanting in the element of novelty usually looked for upon such an occasion, but to us his remarks appear to be singularly appropriate and worthy of the earnest attention of every surgeon, and more especially of those who are responsible for the education of future members of the medical profession. It seems to us that the time is not far distant when the question of the administration of anæsthetics in relation to the responsibility of the medical man will assume greater prominence.

It is at present too much the custom to attribute death to unavoidable and accidental causes when a fatality occurs, and for the administrator to disclaim all responsibility.

Considering the fact that chloroform has now been in common use for sixty years, and that the uniform experience of physiologists is to the effect that it is a dangerous drug as ordinarily used, it is astonishing that its administration should not rest upon any definite scientific basis.

In the opinion of Dr. Waller and others who have specially investigated the subject, there can be little doubt that a considerable proportion of the deaths which occur during the administration of chloroform are due to an overloading of the blood with the anæsthetic, or, in other words, are the result of an overdose. Two causes are chiefly responsible for this danger. The imperfect method of regulating the amount of the vapour inhaled, and inexperience on the part of the administrator. The latter cause can in part be obviated by more thorough instruction of the students in the theory and practice of anæsthesia, a point upon which great stress was laid by some speakers in the discussion; and as to the former, without desiring to advocate the use of any special form of apparatus, we would only accentuate the importance of the drug being administered in such a manner as to obviate so far as possible a source of danger which must be regarded as proved by clear and irrefragable evidence.

In regard to the legal bearings of death occurring during the administration of chloroform, it is no doubt true that before a charge of malpraxis could be proved against a medical man, it would be necessary to show gross ignorance and carelessness in the conduct of the case; and, so far as we are aware, such a charge has never been sustained against a qualified medical man in this country in connection with a death under anæsthesia.

During recent years, however, the Crown has caused all such deaths to be strictly inquired into, more especially as regards the precautions adopted by medical men prior to and during the administration, the necessity for the employment of a general anæsthetic, and the presence of any condition in the patient which might be considered to contra-indicate the use of such a drug.

This procedure on the part of the authorities indicates that they recognise that a certain responsibility attaches to the medical man concerned. He must be prepared to justify the procedure he has adopted in the event of a fatality. We doubt very much whether the majority of medical men fully appreciate this aspect of the question, and as regards at least one point we are convinced that the subject does not always receive due consideration. We refer to the choice of the anæsthetic to be employed. It cannot now be denied that chloroform anæsthesia is accompanied by a very appreciable risk to life, and this being so, it is, to say the least, ill advised to run this risk if "gas" or chloride of ethyl, or even a local anæsthetic, will serve the purpose.

We have known of deaths taking place during the administration of chloroform for the purpose of pulling a single tooth, and for such a simple operation as opening a whitlow in a healthy adult man.

It is difficult to persuade one's self, and possibly in the future it will be difficult to convince the Crown authorities, that such cases do not indicate a rashness which is unjustifiable, and which might without undue straining be regarded as culpable.

In any event, we believe that the time has come for the whole question of the administration of anæsthetics to receive much more serious consideration than appears to be the case in many of our hospitals and amongst those intrusted with the training of future members of the profession.

Reform in the Medical Curriculum.

THE new ordinance which Edinburgh University has been successful in obtaining will have, we believe, a beneficial and far-reaching effect upon medical education in Scotland. The chief change which it introduces is that whereby candidates in the professional examinations (first, second, and third) may enter for examination in a single subject after attending the necessary qualifying course of lectures.

It is provided further that in the final subjects, candidates may appear for examination in forensic medicine and public health at any time after completing their third professional, while the examination in midwifery may be taken in December of the fifth winter session, and that in medicine and surgery at the end of this winter, thus leaving the last summer free for the clinical examinations.

The academic year will be divided in future into three terms, and at the end of each of these, professional examinations will be held, namely, in December, March, and July. The effect of this will be that students will have three opportunities in the year of being examined in any subject, provided they have conformed to all requirements of the ordinance and of the Faculty; while another effect, and one which, no doubt, will be hailed with satisfaction by the examiners, is that in future the annoying and unsatisfactory system of special examinations will be abolished.

Needless to say, various objections and criticisms have been urged against the ordinance, the chief of these being directed against allowing candidates to enter for examination in a single subject. This clause appears to have been specially objectionable to our sister university of the West, which, without however adducing any arguments, alleged that it tended to lower the prestige of the degrees of the Scottish Universities. This, of course, is nonsense. The whole object of the change is not to lower but to raise the standard of efficiency of the examinations, a fact which was definitely stated so long ago as 1904 at a conference of the Medical Faculties of all the Scottish Universities. The whole trend of reform in medical education has for many years past been in the direction of trying to get rid of the old fetishes in regard to teaching and the conduct of examinations, which have been handed down from the early part of last century.

The cast-iron conservatism of the Scottish Universities has already done enough harm, and it is time that an effort should be made to bring the teaching and system of examinations more into conformity with common sense and the progress of scientific medicine. It is difficult to conceive what good object is achieved by compelling students to pass subjects, which are by no means always cognate, in groups, or in enforcing an interval, sometimes of many months or even a year, between the fulfilment of attendance on the course of instruction and presentation for examination.

Surely the candidate who devotes his attention mainly or entirely to one subject will obtain thereby a much better and more intelligent grasp of it; and, having thus studied it, and shown a proficient knowledge, he should be allowed to devote himself to other subjects without the incubus of a prospective examination hanging over his head. What other object there can be in preventing him going up for examination at this time, except to add a wholly artificial difficulty to the attainment of his degree, we are at a loss to understand. The new ordinance will not make the passing of the professional examinations and the acquisition of the degree easier, except to the extent above indicated, because one of the chief objects of the change is to secure a higher standard of efficiency, and no student will be able to pass in a single subject unless he obtains "sufficient merit" in the examination, that is to say, unless he fulfils the regulations at present in force in regard to exemption in a single subject of a group.

Two other points have given rise to criticism, namely, the fact that a student may in future pass in physiology before he has completed his course in anatomy. This is an unfortunate necessity, caused chiefly by the difficulty of providing sufficient subjects, so as to ensure that every student has made a complete dissection of the whole body. He can, however, go up for his anatomy examination at the December examination in his third winter, so that the disadvantage referred to is more apparent than real. With another contention that it is wrong to permit midwifery to be dissociated from the examination in medicine and surgery, we have no sympathy—in fact, we regard it as a distinct advantage that the student should be left free to devote the last six months of his curriculum entirely to the two latter great branches of study.

Time alone will prove whether the ordinance fulfils all the hopes that have been set upon it. We have every confidence in the verdict, and believe that the present changes merely represent an instalment of the reforms which are necessary to bring the curriculum into conformity with modern ideas of medical education and the advancement of science.

The Exeter Meeting.

THERE is something quite distinctive in the life of an English cathedral town. The visitor is conscious of a certain impressive dignity, a pervading air of mediæval scholarship. It seems for the moment as though he had left the stream of progress and entered a charming and restful backwater. Those who visited Exeter on the occasion of the recent meeting of the British Medical Association cannot fail to have been impressed with sentiments such as these. The reception accorded to the Association was of the heartiest, and the fickle weather god, strange to relate, smiled uninterruptedly during the week.

Although no announcements of startling discoveries were brought before the sections, the general impression appeared to be that the sectional meetings were quite up to the average standard of interest, and that the subjects chosen for debate had been such as to afford ample opportunity for practical discussion. Dr. Davy, the president, selected as the topic for his address a number of problems concerning physical culture and their relation to the future welfare of the nation. The address in medicine was delivered by Dr. Hale White, who chose as his theme, "A Plea for Accuracy in Medicine." The time that is wasted in demonstrating the errors of premature conclusions cannot be overestimated. "We shall often have to say that we do not know, but, at any rate, our refusal will not retard, but will rather advance the progress of medicine." In this sentence the lecturer emphasises a truism, which might with benefit be given to every scientific worker at the outset of his career, and which calls for emphasis from every teacher. Mr. Butler, who delivered the address in surgery, chose as his subject the data in favour of the auto-inoculation of cancer.

Dr. W. J. Mayo.

DR. WILLIAM J. MAYO, the distinguished American surgeon, has been on a visit to the old country. After spending a few days in Liverpool, he made his headquarters for a time in Edinburgh, and visited the anatomical and other departments of the University and the operating theatres of the different hospitals.

The variations in the shape and position of the stomach provided the subject for an interesting talk with the Professor of Anatomy, while the inspection of the roll-book of the first Monro furnished a tangible link with the past such as rarely fails to appeal to the sentiments of the citizens of the Great Republic.

In the operating theatres Dr. Mayo proved himself an interested and an interesting critic, indulgent also, because it is the surgeon of great experience who is most alive to the difficulties of a case. Like most of his fellow-countrymen, he is an out-and-out adherent of the aseptic as opposed to the antiseptic technique —if these terms are still permissible—and is inclined to condemn absolutely the use of chemical agents of any kind during the actual progress of an operation in clean tissues. He declined to operate himself—in our opinion very wisely—as, although it would have been interesting for those who are unable to visit America to see so distinguished a surgeon at his work, it has come to be recognised that a surgeon should not operate away from his own staff of assistants and his own armamentarium, apart altogether from the fact that he may not have had sufficient opportunity of observing the case upon which it is proposed he should operate.

He was greatly impressed with the Royal Infirmary, and with the fact that so small a town as Edinburgh should possess a hospital provided with 850 beds.

An interesting item in his visit was the signing of the roll-book of the Royal College of Surgeons, of which he was made an Honorary Fellow on the occasion of its fourth centenary two years ago.

Post-Graduate Course. WE are glad to learn that the Post-Graduate Vacation Course in Medicine, which is being held this month, promises to be as successful as that held last year. A considerable number of graduates from abroad have already arrived, and most of the classes during the first half of the course are well filled. It is a matter of satisfaction that it has been found possible this year to institute a course on Operative Surgery, conducted by Mr. Alexis Thomson and Mr. Miles. Such a class is especially useful to members of the Public Medical Services, and it is hoped that circumstances will permit of its being repeated not only at the Annual Vacation Course, but also at other periods of the academic year, in conjunction with the continuous scheme of post-graduate instruction which the Committee is endeavouring to inaugurate.

The Royal College of Surgeons have decided to entertain members of the present Course at an "At Home" in the College during the month, so as to afford teachers and graduates an opportunity of inspecting the Museum and of meeting in friendly intercourse.

Dr. Milligan. THE death of David Milligan, M.B., C.M., which occurred on the 17th ult., caused deep regret amongst a large number of his professional brethren in Edinburgh. He began the study of medicine comparatively late in life, and graduated in 1883. He settled down in general practice, and his sterling qualities, both as a man and as a physician, soon obtained for him a wide circle of friends and patients. Nearly six months ago he knew that an incurable disease must shortly exact its toll, but he bore his great trial with exemplary fortitude, and when the end came he was residing at Gullane with his family, to whom we desire to express the deep sympathy of a large number of his colleagues.

ORIGINAL COMMUNICATIONS.

THE ALCOHOL QUESTION AND TEMPERANCE.

By Sir Dyce Duckworth, M.D., LL.D., F.R.C.P., *Consulting Physician to St. Bartholomew's Hospital; Senior Physician to the Seamen's Hospital, Greenwich.*

The subject of alcohol with respect to its use and abuse by man has enlisted a large share of attention during the last thirty years, especially in this country and the United States of America, and more recently on the Continent of Europe. Statesmen, philanthropists, physicians, physiologists, and ministers of religion have all contributed their opinions upon this matter. It appears fairly certain that an analysis of these declarations, could it be made, would indicate that the majority of those who have taken part in discussing the question are disposed to regard the employment of alcoholic liquids as not only unnecessary, but positively injurious to the health of the body, and no less damaging to common morality. Some of the more earnest advocates of abstinence from alcohol would abolish, if they could, the production of it in any potable form.

It may be safely affirmed that these discussions have directed public opinion to a fuller consideration of the question than it has ever received before, and have tended to promote a more temperate employment of alcoholic beverages in several classes of society.

While recognising these beneficial changes, we have still, unhappily, not far to seek for evidence of over-indulgence, and even of gross misuse of alcohol, arising not seldom from ignorance and thoughtlessness on the part of persons not otherwise unintelligent or altogether demoralised. A crusade in favour of strict temperance has therefore to be maintained, and those who are leading it have to see that their efforts are conducted on sound and enduring principles.

It is to be noted at the outset, in considering these principles, that the energetic so-called temperance reformer is an abstainer and abolitionist both by example and precept. The so-called "moderate" drinker has hitherto had little or no influence on any temperance platform, and, as a rule, is barely tolerated or listened to either by his total abstaining colleagues or the audiences he addresses, the latter commonly consisting, for the most part, not of intemperate or moderate drinkers, but of convinced abstainers. The moderate side in this vexed question has practically had very little hearing, and has been most inadequately set before the inquiring public. The "moderates," indeed, are not seldom credited with indifference, if not taunted with actual hostility, to the cause of what is termed "temperance" by total abstainers. There can be no doubt that the main object in view of most of the various temperance organisations, in all countries, is the promotion of total abstinence from all alcoholic beverages throughout life. If this is the case, the efforts made by these societies have little or nothing to do with the inculcation of a temperate employment of these beverages. It is necessary to be quite clear on this point, for if my contention is admitted, most of these organisations are distinctly misnamed, and their avowed object is not plainly disclosed to the public.

I am not writing at random, for in my earlier efforts in the cause of temperance I have been rudely received by audiences of enthusiastic abstainers when I have pleaded for a rational and truly moderate employment of alcoholic beverages, evincing plain evidence of an intolerance and prejudice which unhappily too often characterise the pronounced total abstainer. Anything which may fairly be said or urged in favour of a legitimate employment of alcohol in any form is shown to be devoid of all interest, and unworthy of the least consideration on the part of large numbers of abstainers who have embarked on a crusade of their own, one in which the question of temperance has no part, and one in which the great majority of sensible and level-headed people will not accompany them.

I note next, that the term *temperance* distinctly implies *use*, and not prohibition or abstinence. The Christian, and therefore the highest, conception of temperance implies legitimate use of all God's gifts to man. The Church can give no other teaching, though it certainly has scriptural authority for certain examples of abstention which may help to encourage and uplift vicious or self-indulgent brethren. Such examples we warmly appreciate and are thankful for. Neither on scriptural nor ecclesiastical warranty is total abstention from alcohol anywhere enjoined for Christian people.

It is with this conviction that I am moved once more to plead for a wider and, as I believe, a sounder basis whereon to enforce the habit of temperance amongst all classes in respect of the employment of alcoholic beverages. Methods for reclaiming drunkards can hardly be regarded as appropriate for inculcating the principles of temperance, yet these are commonly set forth as the only remedies for checking the misuse of alcohol in all communities. As has been well said, "intemperance is the father of teetotalism." True temperance will never be promoted by exaggeration, or by inaccurate pronouncements respecting the effects of a legitimate employment of alcohol. Such statements, one regrets to find, are the stock-in-trade, so to say, of the temperance orator, and are obviously at variance with facts and with ordinary experience. Support for many of these declarations is occasionally adduced from the laboratories of the physiologist and the pathologist. It may be safely affirmed that no member of the body politic is more likely, by reason of his calling and experience, to be familiar with the mischief wrought by misuse of alcohol on the various textures of the human body than the physician; and no one better than he is so able to judge of the effects produced by the habitual use of it in strict moderation upon his fellow-men. He knows full well the harmful effects induced by what I have elsewhere described as "immoderate moderation," implying a routine and slightly excessive daily employment of alcohol. Again, no one can know better than he the value of this agent in various phases of disease, for he has been carefully instructed on the subject by his clinical masters in accordance with sound principles, which are apart from all fashion, and he finds for himself the truth of these as he pursues his daily practice.

It is necessary here, even in these days, to call attention to the fact that by "alcohol," in all these vexed discussions on the question of its use, is simply meant any beverage into which alcohol enters either in large or small quantity. Much foolish writing and talking has come from wilful or innocent ignorance in regard to this elementary fact.

Some of the latest arguments in favour of total abstention have, as I have just stated, come from the laboratories. Let us consider these. In the case of the pathologist, it must be noted that he is dealing with investigations relating to the ultimate outcome of the long-continued abuse of alcohol upon the several textures of the body, the worst expressions of the mischief which have led to premature death. The physician is sadly familiar with these results of the grossest intemperance, but finds nothing to learn from them in respect of a truly temperate employment of alcohol. Any morbid conditions which may be fairly attributed to alcoholic influence in an appreciable degree plainly indicate excessive consumption or misuse during life. *Such changes are not found after death in the bodies of temperate users of alcohol.* The physiologist, who is not a physician, deduces his arguments in favour of total abstention from experiments upon the lower animals. To poison dogs and other creatures with full doses of alcohol (not alcoholised beverages), and to find the ravages induced by this rapid poisoning in their textures, is surely not to provide an apposite lesson wherewith to assist rational human beings to determine whether they will carefully employ any alcoholised beverage as part of their dietary. These dire results throw no light whatever on the question of temperance, but they carry great weight with many good people as evidence of an advanced scientific study of the matter.

It has long been known that some individuals are intolerant of any variety or quantity of alcohol, and discover the fact for themselves. Such an idiosyncrasy is not peculiar in respect of alcohol, and applies to many other agents, dietetic and medicinal. The ranks of abstainers contain a certain number of people for whom alcohol in any form is unsuitable, and who have benefited by ceasing to employ it. They not unnaturally seek to commend their enforced practice to others who are void of their peculiarities.

If we are to judge and act upon the dogmatic statements now so often made respecting the impropriety, and the moral and bodily danger, of employing any alcoholic beverages, we are forced to conclude that the teaching and practice of some of the wisest and best physicians in all countries have been utterly wrong and misleading. It is true to state that within the last forty years there has been established a more accurate knowledge of the action of alcohol on the human body, both in healthy and morbid conditions; but by the light of carefully gathered experience nothing has been discovered to prove that its employment in strictly moderate amount has had any but beneficial effects either upon mind or body. I, for one, refuse to believe that our great predecessors in medicine, in distant or in more recent times, were thoughtless or unwise men. Those I have in my mind were prudent and thoughtful observers of their fellow-men both in health and disease. They were certainly partisans of true temperance, certainly not of total abstention. Nor is it necessary to summon medical opinions exclusively on this matter. Have we not the consensus of the majority of the best and most level-headed men in all times, who have done the best work in the world in the best possible way, in support of a truly temperate use of alcohol? It is surely worthy of note that the most enlightened and progressive nations of the world are those in whose dietary some form of alcohol is included, and I am amongst those who conceive some relation to exist between a nation's diet and its capacity for mental and bodily attainments. The Hebrew race, for example, has always taken alcohol, and is one of the healthiest still existing in all parts of the world. The Japanese consume one-third as much alcohol per head as is taken in England in the form of beer.

It is of some interest to learn what was thought of this question of temperance in the early part of the fourth century. Here is a remarkable passage taken from the "Book of Paradise,"[1] written by an ascetic monk in a Coptic monastery. Palladius, writing to Lausus, remarks: "It is better to drink wine in moderation than to drink water immoderately, and it appeareth to me that those who pridefully use water in an immoderate fashion are depraved and pleasure-loving. Do not therefore ascribe blame or praise to the eating or not eating of food, or to the drinking or not drinking of wine, but ascribe praise or woe unto those who make use properly or improperly of meat or drink." To this I will add an apt quotation from a learned paper by Dr. Wickham Legg,[2] to the effect that "in the eighteenth century it would seem that Churchmen had not yet discovered that in order to be a Christian you must become a teetotaller. This return to an ancient heresy was reserved for the decadence of our own age."

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[1] Translated from the Coptic by E. A. Wallis Budge, Litt.D.

[2] "London Church Services in and about the Reign of Queen Anne," Trans., St. Paul's Ecclesiological Soc., vol. vi.

A due consideration of this question compels our attention to the daily habits of humanity. We have to note the results of a proper use of alcohol as affecting the lives and characters of the members of civilised societies. It has not been shown, and I believe it never will be shown, that the human race has been anywhere injuriously affected by a truly temperate employment of alcohol. That improper use of it is harmful to the best development of any race is a well-ascertained fact, but the abuse of anything is no argument against its legitimate use. It is often declared that the ill effects of alcohol are so grave, and so widely in evidence, that it is safest on all accounts to abolish its use. This is but to take note of the acknowledged evils of misuse which are sadly appreciable, and to ignore what is equally certain and true, that there is a vast practical knowledge of the value and beneficent use of alcohol when appropriately employed, which is also in daily evidence. Such an employment of it is not a mere indulgence in an unnecessary article of diet, but is an aid and a comfort to humanity in the course of the ordinary and wholesome duties of life. That this view of the question will be regarded as shocking and even mischievous by many good people, I have no doubt, for that has been my experience in having urged it many times in the course of many years; but I have never found reason to alter my opinion.[1]

We may be thankful that the question of temperance in regard to the employment of alcohol is now widely discussed. The efforts made hitherto have certainly led to a more careful consideration of the facts and causes of our national abuse of alcohol, yet there still remains the larger part of most communities either indifferent to the lessons of moderation, or unconvinced of the necessity of total abstention, which is frequently urged by the more fervid advocates in all so-called temperance organisations. When we find these efforts made with the main purpose of prohibiting all employment of alcoholised beverages, and such total abstention supported by some authorities whose opinions may fairly be expected to carry great weight, it is time to utter a protest from the moderate side in the name of Christian freedom, large human experience, and plain common sense.

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[1] (1) "On the Medical Aspects of Intemperance in Strong Drinks," Address, 1877. (2) "On the Medical Injunction of Stimulants in Disease and in Health," *Practitioner*, London, 1877. (3) "The Moderates, their Position and Duty," Address. (4) "On the Moderate Use of Alcohol," *Practitioner*, London, 1879. (5) "The Necessity for Amended Legislation in dealing with Habitual Drunkards," a Paper read at the Folkestone meeting of the Church Congress, 1892. (6) "The Relation of Alcoholism to Public Health, and the Means to be adopted for its Prevention," *Trans. Internat. Cong. of Hygiene*, London, 1893. (7) "Rapport sur les conséquences de l'usage et de l'abus des Boissons alcooliques sur l'organisme humain," *IV. Cong. Internat. contre l'abus des Boissons alcooliques*, La Haye, 1893. (8) "On the Employment of Alcoholic Drinks from a Life Assurance Point of View," *Cong. Internat. des Medecins experts de Compagnies d'Assurance*, Amsterdam, 1901.

It will doubtless be asked, in what does moderation in the use of alcohol consist? Moderation here means very little. Physiologists have agreed to limit the daily consumption by the adult to such an amount of alcoholised liquor as may contain not more than four or five tablespoonfuls of ordinary spirit.[1] Physicians will declare without any hesitation that even this amount would in many instances be an immoderate allowance for any adult, although within the physiological limit. There can be no routine in the matter. The manner of life, whether urban or rural, the age, occupation, habits, and peculiar individual tendencies have all to be regarded. It has been often remarked that if the amount just indicated is so small, there can be little necessity for employing it, and it may well be dispensed with altogether; and, again, that the fact of a limited indulgence in alcohol is only too likely to lead to abuse, and induce a craving for larger quantities. These contentions must be denied. Correct teaching in early life, and the implanting of wholesome principles, should prevent excess in all cases where there is no inherent morbid propensity to it. The descendants of drunkards are wisely advised to abstain, and more particular care in enjoining any variety of alcohol is required in the case of women. "Alcohol is a bad master, and a good servant"; the latter affirmation is not commonly pressed home. The employment in moderate quantity must only be in relation to meals, preferably once in the day. What is constantly forgotten in discussing this question is the fact that in good wine or beer there are many other wholesome ingredients besides alcohol, presented in these forms in the most favourable condition for the welfare of the body. If people are so foolish as to take these liquids at odd times, between meals, and carelessly to injure their health and capacity for good work, that can be no reason for withdrawing them from their appropriate use by rightly controlled and rational people.

There is therefore need for education as to the legitimate use of alcohol. That is the temperate use, and a spread of such knowledge and practice will not fail to accomplish all that every sensible advocate of temperance could desire to see all over our empire. In the meantime it must be recognised that there are strata in our society which may be regarded as unfit to employ alcohol in any form, consisting of the ignorant, careless, and unstable classes, who may well be enjoined to abstain altogether from it. The temptations which beset them are still too prevalent, and the discomforts and thriftlessness of their homes, though gradually lessening, are painfully in evidence. Reformation, however, is proceeding, and our present hospital experience bears witness to this as compared with that of half a century ago. There is less hard drinking, and the efforts of our clergy, parish workers, and other civilising agencies are beginning to tell effectually.

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[1] *E.g.*, brandy or whisky.

The grosser abuses in a large number of cases we might fairly hope to see better controlled than they are now by a more serious dealing with them on the part of our magistrates. It has been well remarked that "the Law is unduly severe upon acts committed as a consequence of drunkenness, but unduly lenient to the habit of drunkenness itself."[1] Cumulative fines, imprisonment, and withdrawal of the franchise for municipal and State purposes, carried out without any distinction of class, would, I believe, rapidly work a reformation in the habits of many members of the community. I have little faith in a recently introduced method of dealing with drunkards in one of the American States, whereby it is hoped to secure a practical reform by compelling the offender to take a pledge of total abstention, and to remit any degree of penalty. There exists already sufficient experience to prove the inadequacy of such a method, although it meets with a measure of approval already from some of our modern sentimental legislators.

For the most part, we must, as I firmly believe, look rather to dogmatic Christian teaching and influence for the young, and a wholesome example in all quarters to secure the enduring principle of strict moderation, and the truly temperate use of all God's gifts to mankind. To this I would add a systematic course of instruction in hygiene appropriate to the intelligence of all whom the State compels to be educated. The truth, and the *whole* truth, relating to the use of alcohol should be expounded, and its lessons enjoined. Exaggeration and false physiology will fail of their purpose to create a sound opinion in after life, or indeed at any time.

The Semi-Teetotal Pledge Association, recently formed, is set on right lines. The name is not free from objection, and this body has, oddly enough, become amalgamated with the Church Temperance Society. This would appear hardly necessary, inasmuch as the latter distinctly recognises a moderate branch of its organisation. If that branch has any meaning, it must be worked on the principles of the newer body, which are simply those of strict temperance. It may, however, well serve to accentuate the main line of conduct demanded from all intelligent and prudent persons, and its denunciation of the prevalent and pernicious habits of irregular drinking may, we may fairly hope, bring home to large numbers of careless and self-indulgent persons in all classes the folly and dangers of persisting in these evil customs.

Our total abstaining friends are apt to regard the moderate drinkers as little in earnest in the necessary warfare against intemperance in any degree. They require to be assured that all thoughtful persons on the moderate side, though they do not see eye to eye with them in their principles and teaching, are just as much in earnest as they are in the matter, and venture to believe that they are on the side of truth, and justified in the firm belief that "moderation lasts long," and is the law of God for man.

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[1] "The Origin and Development of Moral Ideas," Edward Westermark, Ph.D.

A RÉSUMÉ OF KOCHER'S WORK IN ABDOMINAL SURGERY.[1]

By Alexis Thomson, F.R.C.S.Ed.

It is in the field of abdominal surgery that the operating surgeon now achieves the most brilliant results from his labours. In marked contrast with the former fear of opening the peritoneal cavity on account of infection, we now know that the healthy peritoneum possesses a greater tolerance for infection than the majority of the other tissues of the body. In order to be successful in the practice of abdominal surgery, the following points must be attended to. In the preparation of the patient the stomach and intestine must be emptied two days before the operation, and kept empty, and the blood pressure improved by the introduction of salt solution. It is held to be a mistake to give laxatives the day before, and still more on the morning of the operation, because one is then operating in a period when the number of bacteria in the intestine is increased, such increase being an invariable accompaniment of diarrhœa. The bowel should be emptied two days before, while for twenty-four hours before the operation small doses of bismuth are given in order to diminish the formation of gas. In operations in the lower part of the abdomen and pelvis the lower part of the trunk is to be raised, while in operations on the stomach and liver the epigastric portion should be elevated. In all cases in which it is impossible to bring the affected organ outside the wound, as is so readily done in the case of the appendix and in ovarian tumours, the incision must be large enough to afford free access to the organ with the object of rendering it movable, and during these manipulations the surrounding parts of the peritoneal cavity must be suitably protected. As soon as the abdomen is opened, the healthy areas of the peritoneal cavity and the healthy organs must be shut off by packing with abundant gauze wrung out of hot salt solution. The peritoneum must sustain the minimum of damage, and must not be irritated by antiseptics or have its vitality lowered by cooling or drying, and therefore all exposed peritoneal surfaces must be kept moist with gauze wrung out of salt solution. All areas of infection must be removed, or, where this is impossible, must be opened into

[1] Abstracted from the fifth edition of Kocher's "Operationslehre."

and packed with zeroform gauze, iodoform being regarded as too poisonous for this purpose. Any collection of blood or wound secretion is to be avoided by the arrest of every bleeding point, and the covering over of raw surfaces by suturing the peritoneum over them. The wound in the abdominal wall must be completely and reliably closed except at the point of emergence of the drain, where this is employed, and if gauze packing has been inserted it should be surrounded by guttapercha tissue—the "cigarette-drain" of M'Cosh.

In the after-treatment attempts should be made to secure free respiratory movements, and if these are restrained by pain, morphine should not be withheld. Attempts also should be made to encourage peristalsis and favour the escape of intestinal gases, while at the same time the blood pressure is maintained by the introduction of salt solution in abundance by one or other of the approved routes.

The question of *hernia after abdominal operations* is intimately connected with that of asepsis and the materials employed for suture. He who is not sure of his asepsis is obliged to use catgut for buried sutures. Kocher asks, "How can people go on using catgut for suturing the wall of the abdomen, when Madelung has recorded over a hundred cases where the wound has burst open because of it?" For the union of layers of fascia, aponeurosis, or muscle, the suture material must not be absorbable, and must therefore consist of silk boiled in corrosive sublimate.

In the planning of *incisions in the abdominal wall*, it is essential that the nerve supply of the muscles should not be interfered with; incisions made at the outer border of the rectus are very liable to interfere with its nerve supply and result in atrophy of the muscle. If the incision must be made near the middle line, it should be carried through the sheath of the rectus, the uninjured muscle is then displaced bodily outwards; when the operation is completed, the peritoneum and posterior sheath of the muscle are stitched in one layer, the rectus is brought into place and fixed in the middle line, and finally the anterior layer of the sheath is sutured. Where necessary, one need not hesitate, however, to cut the rectus across, because its different segments are innervated separately. In all lateral incisions the muscles must be separated in the line of their fibres, so as to avoid injury of their nerves.

The most important *complications after abdominal operations* are paralysis of the stomach and intestine, pneumonia, peritonitis, thrombosis, and embolism of abdominal blood vessels, and hæmorrhage from the stomach and intestine.

Acute dilatation of the stomach becomes dangerous if it is not at once recognised, and the viscus emptied with the tube.

Paralytic distension of the bowels is very common, and is partly due, in the first instance at any rate, to the arrest of the passage of flatus, while later it is due to disturbances of the circulation in the wall of the bowel and stagnation and decomposition of the contents. Kocher has obtained "wonderful" results from the administration of physostigmin for promoting the return of peristalsis. The stagnation and decomposition of bowel contents must be remedied by injections and irrigations of the bowel from below, and when the tract is cleared by the administration of laxatives by the mouth.

Lung complications occur most frequently after laparotomies in the upper half of the abdomen, probably because of the disturbance of respiration through the pain caused by contraction of the diaphragm. He distinguishes three forms—the inhalation pneumonia, the hypostatic, and the infective—and he gives directions how these may be best prevented.

Hæmorrhages from the stomach and intestine are possibly due to retrograde embolism from the veins, and he thinks it important to avoid anything which will disturb the circulation in the bowels during the operation, as by squeezing and clamping, and in resections employing segments of bowel whose vitality has been lowered. Parts of the intestine or omentum the vitality of which is at all open to suspicion, should be removed. The measures to be employed in operating in the presence of peritonitis are more appropriately discussed in relation to appendicitis.

In *abdominal tuberculosis* the object of a laparotomy is not only to get rid of the exudate but to discover the source of the disease, and if possible remove this, as may be done when it arises in the tubes, in the intestine, or in the appendix. An extensive incision is made in the middle line, the fluid drained off, and the peritoneal cavity thoroughly irrigated with salt solution, especial care being taken that no additional infection is introduced, as thereby the whole complexion of the case may be altered; for the same reason it is better to avoid drainage. In cases in which the primary seat of the tuberculosis has been removed, and it has been necessary to pack, iodoform gauze wrung out of 5 per cent. carbolic lotion should be employed wrapped up in guttapercha tissue; when this packing is removed, iodoform glycerine should be inserted in its place.

In the chapters on "Hernia" there is little that is new, but it is interesting to find that, with increased experience, Kocher believes that in the *radical cure of inguinal hernia* his method gives the best final results. He affirms that in his own clinic it has been found to yield 97·7 per cent. of cures. With regard to Bassini's method, he regards the free exposure of the inguinal canal by dividing the external oblique aponeurosis as the most important part of the operation, and he therefore employs it in all complicated hernias, but he regards the deep suture of the walls of the canal as unnecessary. The invagination and displacement of the neck of the sac is the essential part of his own operation, and is to be employed whenever possible. Where invagination is not practicable on account of the condition of the sac, the lateral displacement alone is found to be reliable. In closing the canal he merely invaginates the yielding anterior wall by a series of sutures, and does not stitch the deeper parts.

Bad results are stated to be due to failure in asepsis and the use of catgut. In *very large hernias*, in which difficulties are met with due to adhesions and to insufficiency of room within the abdomen for the protruded viscera, one is better to abstain from operation unless one is forced to it by threatenings of strangulation, as the operation may be complicated by the necessity of performing entero-anastomosis or a resection, and the large opening in the abdomen may require to be closed by means of flaps such as one taken from the rectus, and it may be further advisable to remove the testis.

The radical operation for *femoral hernia* has yielded only 71·6 per cent. of radical cures, and yet Kocher appears to be satisfied by the invagination and displacement method, with the addition that Poupart's ligament is tacked down to the pectoneal fascia. He does not appear to favour Roux' method, nor does he appear to be aware of the admirable method introduced by Battle.

In operating for large *umbilical hernias*, he lays stress on the danger of thrombosis of the veins of the omentum and mesentery, and advises rather the retention of portions of adherent sac upon the omentum or intestine than any attempt to remove the adherent sac completely. He does not appear to have any knowledge of the overlapping method described by Mayo.

In introducing the surgery of the *gall bladder and bile ducts*, Kocher explains that while his experience may not be so extensive as that of Kehr, of Robson, or of Mayo, his mortality is less than any one of these, so that he feels justified in recommending those methods of operation which he himself has tested. With regard to the incision employed, while no single one will suffice for all cases, he gives the preference to his own oblique incision, which commences at the apex of the ensiform cartilage and runs downwards two fingers' breadth below and parallel with the costal margin, lower down tending further from the costal margin, and terminates over the convexity of the abdominal muscles; the rectus is cut across in its whole breadth, while the nerves passing to it are drawn aside. Access is still better with the angular incision of Czerny, one limb of which extends from the ensiform to the umbilicus, while the other passes out at right angles to this, dividing the rectus completely but sparing its nerves; he has found that Mayo Robson's incision does not give quite so good access as either of these.

After referring to the projection of the lower thorax by a large sandbag, and the rotation of the liver upon itself, he regards the method which he introduced of mobilising the duodenum as capable of rendering great service in operations upon the bile ducts. In exceptional cases, more room may be obtained by breaking the seventh and eighth cartilages at their junction with the ribs in order to raise the costal margin sufficiently.

In discussing operations upon the gall bladder, he expresses decided opinions on the merits of what has been called *ideal cholecystotomy*. He has never seen any trouble following it; it assures the most rapid healing and the least trouble from adhesions. It must be performed only in suitable cases when the biliary passages are free, when there are no marked inflammatory changes in the wall of the gall bladder, and when there are no changes in the cystic duct associated with an impacted stone. If these conditions be excluded, the ideal operation is a simple and valuable one, and especially suitable in early cases of cholelithiasis. It has usually been objected to by other surgeons because it does not afford the free drainage which cholecystostomy provides, but Kocher maintains that when the inflammatory products of the gall bladder are catarrhal in character, the natural drainage into the intestine is quite sufficient.

The technique in *cholecystostomy* does not call for special mention; it may be noted, however, that the water-tight fixation of the drain tube in the gall bladder devised by Poppert is an important addition to our technique, as it enables us to dispense altogether with the attachment of the gall bladder to the parietal peritoneum.

In discussing *cholecystectomy*, he describes himself as not among those who regard the gall bladder as of as little importance as the appendix, and he enters a protest against the routine practice of removing the gall bladder in all cases of cholelithiasis. His argument is shortly as follows:—

If stones re-form at some future time, which is quite possible, the operative treatment therefor is rendered much more difficult, and is attended with greater danger. Moreover, the removal of a thickened and adherent gall bladder is often a difficult operation, having a distinct mortality—a little over 3 per cent. in the best hands,—and, further, being attended with hæmorrhage, is more liable to be followed by adhesions and after-trouble from these.

He regards the following as indications for the removal of the gall bladder: in malignant disease or well-founded suspicion of the same; when there are marked inflammatory changes in the gall bladder, whether of the acute variety corresponding to those in acute appendicitis, or of the chronic type associated with thickening and contraction or distension in the form of empyema or hydrops; also in chronic thickening of the cystic duct, for the obvious reason that unless the cystic duct is permeable the function of the gall bladder is lost. At the same time he agrees with Mayo Robson that the duct may appear obstructed at the time of the operation, and yet at the end of it, or a few hours or days later, it may again become permeable.

In performing cholecystectomy, when it is possible he divides the cystic duct and artery in the first instance, and then shells out the bladder from its bed, but if the access to the duct is not good; it is better to split the peritoneum over the fundus in the first instance. If a cholecystectomy is intended and it is impossible to be certain of the condition of the biliary passages, or if these are known to be diseased, the gall bladder is laid open throughout from an opening in the fundus through the cystic duct as far as its junction with the hepatic, a drainage tube being inserted into the hepatic duct and retained there by suture. As a rule, however, he thinks it better, if possible, to preserve the gall bladder, and perform a cholecystostomy at the same time as the hepatic duct is drained.

When it is proposed to make a *communication between the gall bladder and the intestine*, he thinks the duodenum is the portion to be preferred, and the anastomosis is rendered easier if the duodenum be mobilised. In performing the operation—cholecystenterostomy—the gall bladder is opened at the fundus and emptied, and, having made certain that the cystic duct is patent, a lateral anastomosis is effected between the gall bladder and the duodenum, while the opening made in the fundus is made use of for drainage by means of a tube inserted in a water-tight manner, the object being to divert the bile externally until the anastomosis is soundly healed. In discussing the relative merits of an internal and external biliary fistula, he thinks that in much reduced individuals an external fistula should be preferred as being the simpler, and if the contents of the bladder are infective, especially when there is suppuration, it is much more satisfactory to provide for their escape externally.

The various *operations upon the common duct* have been rendered easier by the mobilisation of the duodenum; in the very difficult cases with extensive adhesions the access to the common duct is rendered easier by splitting the gall bladder and cystic duct down to the junction of the latter with the hepatic duct, and, having dealt with the common duct, the gall bladder is afterwards removed. Unless there is an accumulation of infective secretion in the duct above, he prefers to close the wound in the common duct by suture, provided the entrance into the duodenum is patent; if, on the other hand, there is an accumulation of infective secretion, he inserts a drain into the hepatic duct, and closes the remainder of the wound in the common duct by means of sutures. Another alternative is to open the gall bladder and pass the drainage tube into the hepatic duct through the cystic duct.

With regard to the question of *crushing stones in situ*, he thinks the procedure quite a good one when the stones are soft enough to permit of it.

Access to *the hepatic duct* is often difficult, and it is here that the extensive angular incision may be required, and it may also be necessary to break the cartilages at their junction with the ribs. Further, if the access is rendered very difficult by the presence of adhesions, one may reach it most certainly by splitting the gall bladder and cystic duct throughout their whole extent.

Under the heading of "Hepato-Cholangiostomy" he describes the opening of the dilated bile ducts which project upon the surface of the liver in cases of biliary obstruction. By cutting down on these and incising them, an outlet for the bile may be afforded until the obstruction relieves itself, or is relieved by a second operation.

In the surgical treatment of cirrhosis, the opinion is expressed that *the Talma operation* has established itself as one of great value; in performing it the omentum should be dealt with in the first instance, but when the fixation of the omentum has failed or is not practicable, the spleen should be drawn out and fixed in a pocket between the parietal peritoneum and the muscles. Considerable benefit also has resulted in cases of hepatic cirrhosis attended with jaundice, by performing cholecystostomy at the same time, and draining away the bile externally. In operating for ascites, the fluid in the peritoneum should be drained away by means of tubes for twenty-four or forty-eight hours, but the prolonged use of tubes is to be avoided, as it is inevitably followed by infection,—a statement which we can confirm from our own experience.

There is little that is noteworthy in the description of the other *operations upon the liver*, and the same may be said with regard to those on the *spleen*; in operations upon the *pancreas*, the mobilisation of the duodenum is again referred to as greatly improving the access in difficult cases.

A great deal of space is devoted to the *surgery of the stomach*, and it is pointed out that it is a matter for congratulation that practitioners are coming to recognise more and more that a large proportion of stomach affections can only be cured by surgical means.

The operation of *gastro-enterostomy* is referred to as having rendered invaluable service, and the technique is so improved that there is no danger in the operation itself nowadays, but only in the accompanying complications. It is held as proved that the entrance of bile into the stomach does not cause disturbance so long as the outflow from the stomach is quite free. If the method of operation secures a certain outflow, then it does not matter whether the union is made in front of or behind the transverse colon. It is more important that the opening should be made at a point in the stomach where it will be emptied with the greatest certainty, and this is in the great curvature in the region of the antrum of the pylorus, because when the stomach empties itself the antrum forms the lowest point, and in it the peristalsis is greatest. He agrees with Mayo in saying that the vicious circle is more apt to occur with an open pylorus; the inference is obvious, therefore, that when the pylorus is open one must be very careful as to the method of operation selected. When the pylorus is narrowed or blocked, any method will do.

He describes as the normal method the antecolic gastrojejunostomy of Wölfler, improved in the sense that the intestine is to be attached to the stomach over a greater extent, so as to prevent kinking at the junction, and, in the second place, by making a much larger opening—6 to 8 cms. in diameter. The loop of jejunum selected for anastomosis is some 40 cms. below the duodenal junction, while in the stomach he selects the lowest part of the pyloric antrum, and at this point he detaches the gastrocolic ligament from the greater curvature. Where the wall of the intestine is thick enough, he employs three tiers of sutures.

In the retrocolic operation associated with the name of von Hacker, the same portion of stomach is selected for anastomosis, and to it the jejunum is applied in a vertical direction. He does not describe the operation which we now associate with the name of Mayo. Braun's addition of an entero-anastomosis to the anterior operation and Roux' Y-method are also described. He draws attention to the fact that Roux, who discovered the Y-method, has come back to the simple operation when operating for ulcer of the stomach, because in the simple operation the contents of the intestine regurgitate into the stomach and neutralise its acid contents, thus favouring the healing of the ulcer, whereas with the Y-method such regurgitation is impossible.

Gastro-duodenostomy is especially indicated in preference to gastro-jejunostomy when the pylorus is permeable; and now that it is so easy to mobilise the duodenum, the operation is no longer a difficult one, and the results are extremely good, as, of course, there is no question of a vicious circle. He does not refer to Mayo's objection to gastro-duodenostomy, namely, that the gastric contents continue to pass through that portion of the stomach which is most exposed to trauma and is most frequently the seat of ulcer.

Kocher does not think there is any risk of narrowing of the new opening in gastro-enterostomy except in cases where the Murphy button or one of its substitutes has been employed. He does not believe in resecting the stomach for simple ulcer unless in the belief that it is undergoing transformation into cancer, because the operation is a difficult one, and is attended with a much higher mortality than gastro-enterostomy.

The chapter on the treatment of *carcinoma of the stomach* has been largely re-written. Kocher has resected the stomach for cancer in 120 cases, and in the last recorded series the mortality was reduced to 17 per cent. In uncomplicated cases he thinks the operation should be described as "not a dangerous one" when it has been performed by his own method. He does not at all approve of the somewhat general adoption of Billroth's second method as the operation of choice in cancer of the stomach. The closure of the duodenum is very properly described as the dangerous part of the operation. The objection made against Kocher's method, that one endeavours to leave more duodenum than in other methods, so as to diminish the difficulty of bringing it into contact with the posterior wall of the stomach, he does not think is valid, because no more duodenum is required for the anastomosis than for its efficient closure. Since the duodenum can be so easily mobilised, he does not think there should be any objection to his method of gastro-duodenostomy, and that it should be regarded as the normal, because it has all the advantages of Billroth's second method without its disadvantages.

Two different kinds of clamps should be used in resecting the stomach. Ones for crushing are to be used when the viscus is to be cut across immediately beyond the clamp, and the crushed edge invaginated; closure clamps, on the other hand, are applied at a distance merely to control the contents of the viscus. The details of the Kocher operation must be studied along with the excellent figures which illustrate the steps of the operation.

Billroth's second method is described, but, on account of the risk of the vicious circle distending the duodenum and endangering the occluding suture of this viscus, an entero-anastomosis must be added. Inasmuch as this implies two occlusions and two anastomoses, the operation is a very prolonged one. Billroth's first method has been given up, because of the weak point at the junction of the two sets of sutures.

One of the most unfavourable complications of cancer of the stomach is met with in cases where the cancer is adherent to the meso-colon and transverse colon; the great danger when the meso-colon is implicated is that gangrene of the bowel may take place; in operating, therefore, in such cases, it is of great importance to determine the viability of the colon, and the most reliable guide to this is the pulsation of the vessels in the meso-colon. If these do not distinctly pulsate, the colon should be resected straight away. Under these conditions it is better to close both ends of the colon after resecting it, and re-establish the continuity of the canal by making an anastomosis between the lower end of the ileum and the descending or sigmoid colon; in performing this, the ileum should be cut across, the lower end closed, and the proximal inserted end-to-side into the colon.

The criticism is made of the forty-six cases recorded of *total gastrectomy* for cancer, that the majority of them, including Schlatter's well-known case, were not really complete excisions. This makes all the difference, because the leaving of a small portion of the stomach at the cardiac end makes it possible to have reliable stitching, whereas, when the sutures are passed through the œsophagus without any peritoneal investment, they are apt to tear through. He describes two operations for total gastrectomy; in one method the duodenum is joined to the œsophagus; in the other, a loop of jejunum.

Kocher is a firm believer in the benefits of *gastrostomy for cancer of the gullet*, because patients who are nigh unto death through starvation may be restored for several months to a bearable life, and even to capacity for work. The operation should not be too long delayed, because in advanced cases there is much greater risk; the patient being run down with septic poisoning, he is much more liable to pneumonia, heart failure, and periœsophageal cellulitis with perforation into the pleura. The operation described is a modification of Witzel's. It is Kocher's experience that gastrostomy is not of much advantage in cancer of the cardiac end of the stomach, and, as a rule, a jejunostomy is to be preferred.

He does not practise gastroplication or gastropexy, as the results from gastro-enterostomy are very much better.

The surgery of the intestines is introduced with remarks on the essential differences between the large and small bowel. Owing to the decomposition changes in the large intestine, the least contact of the contents with the surroundings almost inevitably causes infection, and the sutures are more liable to become infected, so that even in the hands of experienced surgeons the sutures do not always hold.

As compared with the small intestine, in which the fluid contents can easily pass through a narrow segment whose capacity for peristalsis may have momentarily suffered, the contents of the large intestine easily stagnate when the lumen has been narrowed and the peristalsis disturbed by resection, and there is, therefore, greater strain on the sutures and on the raw surfaces, and, apart from perforation and peritonitis, necrosis of the mucous membrane may take place and lead to metastatic infections, especially in the form of pneumonia in elderly people. In order, therefore, to resect the colon with perfect safety, one must arrange for the escape of the fæces above the site of suture, either by means of an artificial anus, or by anastomosis between the bowel above and the bowel below, *e.g.*, ileo-sigmoidostomy.

In patients reduced by a neglected obstruction of the bowels, one should be satisfied in the first instance with emptying the contents of the bowel by means of an artificial anus. In patients who are not so reduced, and who can stand a laparotomy, it is often wise to make an anastomosis between the ileum and the large intestine below the block, and leave the resection of the colon for a second operation. The anastomosis should be made by the method in which the ileum is cut across, the lower end closed, and the proximal end inserted into the colon end-to-side. In patients in good condition even, it is probably better in the majority to adopt the two-stage method. Although Bloch appears to have introduced the two-stage method, Mikulicz is given the chief credit in furthering its acceptance, and there can be no doubt that since it has been adopted the mortality of colon resections has diminished. In this as in other resections of the intestine, the operation has been greatly simplified by Doyen's crushing forceps, and the risk of infection has been diminished by the use of rubber gloves.

In contrast to the two or three stage operation, which is performed in other parts of the colon, a one-stage method is generally practised in resection of the ileo-cæcal segment. It should be noted that the ileum must not be divided at its lowest part, because there the mesentery is too short; it should be divided at a higher level, so as to allow of the divided end being brought without tension into contact with the ascending or with the transverse colon. In all resections of the colon the raw surfaces in the posterior abdominal wall are to be covered in by bringing the edges of the peritoneum together, and, in addition to the long glass drain which is inserted down to the line of suture, two short drains are placed in the wound in the parietes, as suppuration not infrequently takes place in the abdominal wall.

There is nothing characteristic in the *surgery of the vermiform appendix* except the usual thoroughness which we associate with every department of Kocher's work. He agrees with Roux and others that the radical operation ought to be performed in every patient who has had one attack of appendicitis, and he lays great stress on the necessity, where one has the choice, of not performing the operation until the inflammatory phenomena have entirely disappeared, that is to say, on an average three months after an acute attack. In performing the interval operation, MacBurney's method is that selected, as by it the abdominal wall is most perfectly reconstituted, and the patient can leave his bed in eight days.

With regard to the question of operation in the course of an acute appendicitis, Kocher associates himself with those who believe in the routine early operation. He lays down the law that it is the duty of the doctor in attendance to consider the question of early operation in every case, that this should take place in the first twenty-four hours, if possible in the first six to twelve hours, and that it is better in a clinic than in a private house. At the end of twenty-four hours it may be said that on the average the most favourable time for operation has passed. In operating for acute appendicitis, a larger incision is required than in interval cases, so as to afford better access, not only to the region of the appendix, but for the removal of the inflammatory exudate. It is better not to crush the root of the appendix as is done in interval cases, because the appendix is thickened and friable; it is simply tied off with catgut, or a portion of cæcum may be removed at the same time so as to be able to close the bowel more accurately by means of sutures.

In cases where there is *diffuse peritonitis*, such as those from infection with the colon bacillus or streptococci in adults and by pneumococci in children, he makes an incision above Poupart's ligament on either side, and, having rapidly removed the appendix, there follows a thorough evacuation of the exudate by irrigation with salt solution, a long curved glass tube being used, shaped like the glans penis at its extremity, and washing out in succession the pouch of Douglas, the region above and below the liver, the stomach, spleen, etc., until the fluid returns quite clear. Long, wide drainage tubes are inserted from both incisions downwards into the pouch of Douglas, and upwards along the colon, and warm, moist, frequently changed compresses are applied. If there is paralytic distension of the bowel with accumulation of intestinal contents, the opening in the cæcum where the appendix has been removed may be used for draining the bowel, or one or more fæcal fistulæ are made in the small intestine as advocated especially by Lennander.

He believes also in the Fowler position, the liberal administration of strychnine hypodermically, and in the continuous introduction of salt solution into the rectum as recommended by Murphy. He further insists on the necessity of washing out the stomach and the early administration of laxatives.

When a patient first comes under observation with an already diagnosable abscess, he does not think there is any hurry in opening the abscess, but is inclined rather to have the patient carefully watched, with rest and restricted diet, but without opium; at the same time he confesses that if the abscess is readily accessible, convalescence is hastened by opening it. If the abscess is to be subjected to operation, it must be clearly understood that the removal of the appendix is of very secondary importance. It is often a much better plan to proceed to the removal of the appendix twenty-four hours or a few days after opening the abscess, employing an incision quite distinct from and as far as possible away from the incision for opening the abscess. In this way patients may be discharged from hospital in a couple of weeks, in spite of their having had a large appendicular abscess.

Great interest attaches to the chapter dealing with the *surgery of the rectum*, as we have always regarded Kocher as the most reliable guide in this field. The sphere of surgery in *rectal cancer* has been considerably extended within recent years, and although a considerable mortality is still recorded, the prospects of radical cure are approaching those obtained in other parts of the body. The mortality would appear to range from 3 to 4 per cent. in the easy cases, up to 50 per cent. in the most difficult cases, where nothing but a combined—abdomino-perineal—operation affords any chance of cure. He quotes Mayo's statistics for the combined method, which record a mortality of 26·3 per cent., and agrees with Gross that the mortality from the combined operation is higher in men than in women. So far as the permanent results are concerned, an analysis of eighty-three cases operated on by Kocher showed that there were 25 per cent. of radical cures.

In preparing patients for operations on the rectum, stress is again laid, as in former editions, on two whole days being devoted to clearing out the bowels, while for two days before the operation they are kept absolutely quiet by bismuth and opium, and during this time the patient only receives fluid nourishment from which milk is rigorously excluded.

Although Kraske has the credit of having first directed attention to the posterior route, Kocher's own method, by the posterior median incision with resection of the coccyx, is regarded as the best. It affords good access, it allows one to go high enough and remove everything, and it has the advantage of sparing the nerves and muscles of the anal canal. The operation is specially intended for carcinomata which do not implicate the anal canal, and as the majority of cancers affect the ampulla only, it is the operation which is most often required.

When on account of peri-rectal infiltration and extensive ulceration in the bowel itself there is danger of the rectum tearing in the course of the operation, it is better at once to split the rectum posteriorly in the middle line throughout the whole extent of the diseased portion.

The vaginal incision is to be selected when the rectal carcinoma is fused with the vagina or uterus, and it will usually be advisable to remove the uterus at the same time.

The combined or abdomino-perineal method, which has been chiefly developed by Quénu, is indicated in very highly situated tumours, in which the extent of the disease and its mobility cannot be learned for certain by examination from below; further advantages are that suspicious peri-rectal tissues and glands are more efficiently removed than by any other method, and that in commencing the operation from the abdominal aspect one may, at an early stage in the operation, tie the chief arteries concerned, especially the superior hæmorrhoidal. In spite of the very high mortality, of which Mayo's 26 per cent. would appear to be the lowest, and in spite of its occasionally leaving a permanent paralysis of the bladder, the combined operation gives results which are not obtained by any other method.

The details of the operation described by Kocher are very similar to those given by Quénu and by Mayo.

In operating for *hæmorrhoids*, he prefers the ligature method, and recommends the use of bismuth suppositories, these being inserted thrice daily; he has given up Whitehead's operation in spite of its "elegance," because of the occasional production of stricture.

In the treatment of aggravated cases of *prolapse of the rectum*, he has found colopexy a satisfactory operation, especially when it is combined with a plastic operation on the perineum; incisions being made in front of and behind the anus through which the muscles are shortened. In performing colopexy, he gives the useful hint that when the pelvic colon is pulled upwards, an assistant should observe the effects of this traction upon the rectum from below, and it is only in cases in which the rectum is drawn up and becomes tense that one should proceed to fixation of the colon.

A SERIES OF FIVE CASES OF CÆSAREAN SECTION FOR CONTRACTED PELVIS.[1]

By John A. C. Kynoch, M.B., F.R.C.P., F.R.C.S. Ed., *Professor of Obstetrics and Gynæcology, University of St. Andrews.*

Since the opening of the Dundee Maternity Hospital, seven years ago, there have been admitted forty-six cases of contracted pelvis, which have been treated as follows:—

1.	Extraction (breech presentation)	1
2.	Spontaneous delivery (two premature labours)	10
3.	Forceps	9
4.	Version	4
5.	Craniotomy	2
6.	Induction of premature labour, followed by symphyseotomy	1
7.	Induction of labour	9
8.	Symphyseotomy	3
9.	Cæsarean section	7
		46

In reporting the following five cases of Cæsarean section performed for contracted pelvis, it is interesting to note that three of the patients belonged to Glasgow, where rickets is so prevalent, and consequently where so many cases of pelvic deformity are met with.

The following are the notes of my cases:—

Case 1.—I. Y., æt. 21, was delivered of her first child eighteen months before admission to hospital. She had been thirty hours in labour, when repeated attempts to effect delivery by forceps in Walcher's position failed. Version was then resorted to, and a still-born, slightly premature male child was delivered, there being great difficulty in getting the after-coming head through the pelvis. She presented herself at the Dundee Maternity Hospital on 6th December 1903, supposed to be about eight months pregnant. She was of feeble intelligence, and consequently could give no history relating to her pregnancy. The date of her last menstruation and of fœtal movements could not be ascertained. She was of healthy appearance; lungs, heart, and kidneys normal. She showed obvious signs of rickety deformity. Her height was 4 ft. 4 in., and there was antero-posterior curvature of both tibiæ, less marked in the bones of the forearm. The pelvic measurements were as follows:—

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[1] Communicated to the Edinburgh Obstetrical Society, July 10, 1907.

Interspinous	9 in.
Intercristal	9 „
Diagonal conjugate	3¾ „

True conjugate estimated at about 3 in. The pelvis was of the small, flat, rickety type. Judging from the height of the fundus, the date of pregnancy corresponded to about the end of the eighth month.

Forceps and version having failed to deliver a living child in her previous pregnancy, the alternative methods of delivery were—(1) Induction of premature labour; (2) craniotomy (in the event of forceps failing at full time); (3) symphyseotomy; (4) Cæsarean section. Craniotomy was at once excluded, for, as Sänger has stated, "the medical practitioner who does craniotomy on the living child in a case in which the patient can be removed to a hospital in order to undergo Cæsarean section, with preservation of the child's life, has fallen behind the requirements of the times."

The induction of premature labour would have been almost absolutely favourable for the mother, whilst for the child the chances would have been almost proportionally unfavourable, brought up, as it would have been, in the most insanitary surroundings. With regard to symphyseotomy, the degree of pelvic contraction in this case was perfectly suitable for this method of delivery. But its immediate mortality is not any lower than Cæsarean section performed under the most favourable conditions. It permits of but does not deliver the child, and it prevents the patient being sterilised if this is deemed advisable. With the ever-improving results of the Cæsarean operation, the indications for symphyseotomy will probably come to be narrowed down to cases where forceps in Walcher's position fail, instead of being a recognised method of delivery at a prearranged date. The conditions being favourable, in the interests of both mother and child, for Cæsarean section, and as it was specially desirable in this case to prevent further pregnancies, I decided to let the patient go on to full time, and do the operation at a prearranged date. On the 2nd January, the patient having been prepared as for an ordinary abdominal section, and before the onset of labour, I performed Cæsarean section after the method of Cameron. The child's back was directed to the left side, head presented, heart-sounds distinct. The abdomen was opened in the usual way, the incision extending from 2 in. above the umbilicus to 2 in. above the symphysis pubis. The uterus having been fixed in a symmetrical position, it was surrounded by large flat sponges. A flat vulcanite pessary was placed in the middle line below the fundus and pressed on, in order to permit of the uterus being opened with a minimum loss of blood. The membranes being exposed, the uterine incision was extended downwards, the membranes ruptured, and the child delivered head first, the placenta attached to the posterior uterine wall being thus easily detached. The uterus was then turned out of the abdomen, the edges of the incision everted, and the upper and lower angles compressed by an assistant. Eight deep and six superficial silk sutures were inserted into the uterine wound, the mucosa not being included. The Fallopian tubes were then tied in two places and divided. The uterus responded well to sponge pressure, and, contracting satisfactorily, it was returned into the abdomen, and the abdominal incision closed in the usual way. The child, a female, weighing 6 lb. 12 oz., was slightly asphyxiated, but soon responded to artificial respiration. With the exception of a rise of temperature to 101° on the second day, the after progress of the case was an absolutely satisfactory one. The child was put to the breast at the end of a week, and was nursed throughout the period of convalescence.

Case 2.—Mrs. G., æt. 21, primipara, came under my observation on the 16th February 1906. She stated that labour had been in progress for about twenty-four hours, and that the membranes ruptured soon after labour began. She was a very small woman, with marked curvature of the bones of the legs. Her general condition was satisfactory, and, beyond a slight trace of albumin in the urine, the various systems were normal. Pulse, 84. Pelvic measurements—

Interspinous	8¼ in.
Intercristal	8 „
Diagonal conjugate	3 „
True conjugate	2½ „

The child's back was directed to the right side, head movable above the brim in the transverse diameter, and the os half fully dilated. Cæsarean section being decided on, the operation was performed as in the previous case. The placenta was attached to the anterior uterine wall. The child—female—mature, weighing 6 lb., was nursed during convalescence, and both left hospital well, three weeks after operation. It was ascertained later, however, that the child had died when 2 months old.

Case 3.—Mrs. C., æt. 26, 2-para, was admitted to the Maternity Hospital on 24th January 1906, at the eighth month of pregnancy. The history given by her doctor was, that she was delivered of her first child in September 1904. She had been long in labour before sending for assistance. Attempts to deliver with forceps having failed, craniotomy was resorted to, and with great difficulty the child was pulled through the contracted pelvis. She was sent to hospital as a case suitable for Cæsarean section. She was of healthy appearance; her height was 4 ft. 6 in. She had a wobbling gait, and there was slight curvature of the bones of both legs. The pelvic measurements were as follows:—

Interspinous	7⅗ in.
Intercristal	8⅘ „
Diagonal conjugate	3¼ „
True conjugate	2¾ „

It was decided to keep her in hospital till full time, and to operate at a prearranged day and hour.

At 10 A.M. on 21st February, and before the onset of labour, Cæsarean section was performed, the steps of the operation being the same as in the previous cases. After the removal of the placenta and membranes, I passed my finger into the cervix from above in order to be satisfied as to the patency of its canal. This I found to be very considerably stenosed, as a consequence, probably, of injuries received during the manipulations necessary to effect delivery at the first confinement. I then passed a uterine sound through the cervix, and closed the uterine wound. At first there was copious bleeding through the cervical canal, but with the application of continuous sponge pressure the uterus contracted satisfactorily. Both tubes were ligatured and divided. Ergotin was given hypodermically, immediately before and after operation. The child, a male, weighed 6½ lb., and left the hospital well.

The patient's condition remained satisfactory during the first forty-eight hours after operation. After this she got restless. Pulse became quicker, and she died on the evening of the fourth day, with all the signs and symptoms of septic peritonitis. At the post-mortem all the uterine sutures were intact; but the upper two had become infected, as shown by the presence of pus in their track.

CASE 4.—Mrs. N., primipara, æt. 31, was admitted to the Maternity Hospital at midnight on 27th December 1906, having been in labour for seven hours. Except for chronic dyspepsia, her previous health had been good, and examination of the various systems (beyond a trace of albumin in the urine) presented nothing abnormal. Temperature normal, pulse 76, and general condition satisfactory. On pelvic examination, the cervix was found dilated to the size of a five-shilling piece, membranes ruptured, and the head was lying above the pelvic brim in the transverse diameter. The pelvic measurements were as follows:—

Interspinous	9	in.
Intercristal	10	„
Diagonal conjugate	3¼	„
True conjugate	2¾	„

Cæsarean section was performed as in the previous cases. The child weighed 6 lb., and measured 20 in. On 31st January the urine was free from albumin. Both mother and child progressed favourably, and left the hospital on 5th February.

CASE 5.—E. M., primipara, æt. 22, was admitted to hospital in labour on 23rd February 1907. She was of healthy appearance; her height was 4 ft. 3 in., and there was well-marked lumbar lordosis and curvature of both tibiæ. Examination of the various systems presented nothing abnormal. The os was dilated to the size of a half-crown piece, and the membranes were unruptured. The pelvic measurements were as follows:—

Interspinous	8	in.
Intercristal	9	„
Diagonal conjugate	3½	„
True conjugate	2¾	„

Cæsarean section was performed as in the previous cases. The child, male, weighed 6 lb. 12 oz., and measured 19 in.

Both mother and child made satisfactory recoveries, and left the hospital on 5th April.

There are a few points connected with this operation which the experience of those cases suggests. First, a comparison of the methods of treating the uterus after delivery of the child, and these are (*a*) hysterectomy (partial or complete); (*b*) retention of the uterus with sterilisation either by division or resection of the tubes; (*c*) leaving the uterus without sterilisation—the true conservative operation. Each method has its advocates. With regard to the ethics of sterilisation, there are two conflicting opinions. On the one hand, we have authorities who think that the question is one for the patient to decide; on the other hand, there are those who hold that the operator should restore the patient to as normal a condition as possible, omitting any method of sterilisation, and repeating the operation of Cæsarean section if occasion should arise. The first case which I have reported is one where it would have been unwise to leave the decision to the patient, as her intelligence was so feeble as to prevent her being able to look after herself properly, far less a family. The second case, however, where the patient was sterilised at the time of operation, and where the child died when two months old, would favour the proposal, that sterilisation might with advantage be deferred until a second child had been delivered by Cæsarean section. Granted that the patient is intelligent enough to understand the situation, and that she is willing to undertake the risk of a second operation, then sterilisation may be omitted at the first operation. Many cases are now reported where the operation has been repeated successfully two, three, and four times on the same patient. Yet I hold that it is not justifiable to endeavour to break the record of the well-known case of Frau Rittgen, whose pluck in submitting to Cæsarean section five times led to a fatal termination at the fifth repetition of the operation. In all the cases I have reported the patients were sterilised by ligature and division of the tubes. This I consider a reliable enough method, and safer to the patient than hysterectomy, which I think should be restricted to cases of atony, suspected infection, or new growths of the uterus. Another question which suggests itself is, What is the best time to operate? In three of my cases labour had already commenced, and in two the operation was performed at a prearranged date, and before the onset of labour. Those who recommend waiting till labour has begun, do so because they think there is less chance of hæmorrhage from uterine atony, and that a dilated condition of the cervix ensures freer escape of the lochial discharge. The first fear is groundless, for the uterus contracts quite as well before as after the onset of labour. That a dilated condition of the cervical canal is of great importance, is shown by my unsuccessful case. Here the cervical canal was so stenosed as only to admit a uterine sound, and although this appeared to be sufficient to permit of escape of the lochial discharge, as shown by the occurrence of free bleeding after the operation, yet I feel convinced that if dilatation of the cervix up to the size of a two-shilling piece had preceded Cæsarean section, the case might have run as favourable a course as the others. In my first two cases I incised the uterine wall between the bars of a flat vulcanite pessary, as recommended by Cameron, to diminish the hæmorrhage during the uterine incision; but I discarded it in my other cases, and did not find any marked difference in the amount of bleeding as a result. Further, hæmorrhage during the operation I have found to be best controlled by an assistant grasping the broad ligaments, and subsequently maintaining uterine contraction by sponge pressure. In all my cases the uterine incision was a vertical one, and, so far as I am aware, the transverse incision of Fritsch does not seem to have proved itself in any way superior. Lastly, with sterilised towels well packed round the uterus, it is unnecessary to adopt Müller's suggestion of eventrating the uterus before opening into it, as this involves a very large abdominal incision. But after the uterus has been emptied of its contents, and as a consequence diminished in bulk, the introduction of the uterine sutures is facilitated by bringing the uterus outside the abdomen.

OBSERVATIONS UPON ARTHRITIS IN YOUNG CHILDREN.[1]

By F. J. POYNTON, M.D., F.R.C.P. (Lond.), *Physician to Out-Patients, Children's Hospital, Great Ormond Street; Assistant Physician, University College Hospital, London, N.*

THE occurrence of arthritis in young children and infants is frequently a cause of difficulty to the medical man. There may be doubt as to the nature of the arthritis, and it is by no means always easy to determine whether the condition is an arthritis, an epiphysitis, or a combination of arthritis and epiphysitis. Then again, in infancy, if the arthritis is painful, it may and frequently does give rise to an immobility of the affected limb, which in the absence of any notable arthritic swelling may lead to a diagnosis being made of infantile paralysis. Lastly, as I shall illustrate in this paper, an arthritis may be a symptom of most dangerous illnesses.

GONOCOCCAL ARTHRITIS.—Gonococcal arthritis occurs in very early life, and its etiology and mode of origin have been elucidated.

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[1] A lecture delivered at the Children's Hospital, Great Ormond Street, May 1907.

We owe our recognition of this condition in infancy to the writings of Mr. Clement Lucas, who in 1885 pointed out the nature of this affection. These cases usually arise within the first three months of life. The exciting cause is the gonococcus, its mode of entry into the system is from a purulent ophthalmia, and the origin of the ophthalmia a gonorrhœal discharge from the maternal passages at the time of birth.

There may be a polyarthritis, and the knee-joints are the most frequently attacked. The severity of the arthritis varies considerably, and in some cases the condition looks so acute that profuse suppuration appears imminent, yet Mr. Lucas' experience, supported by later records, enables me to say that these cases usually recover in a month or three weeks without surgical intervention. Exceptionally in marasmic children, or in an infection complicated by secondary staphylococcal or streptococcal invasion, a suppurative arthritis may supervene, and the child be carried off by a rapid pyæmia.

Clearly, then, these cases in infancy require care and judgment, each must be judged upon its own merits, and the temperature, the general and local conditions, and the probable cause, all taken into account. Let me emphasise that at the present time examination and culture of arthritic exudations are, although of great value, but imperfect guides in diagnosis, for the exciting causes of infective arthritis lie in the synovial tissues rather than in the synovial fluid. In one difficult case I was assisted by the distension of the bursa under the deltoid, for with the greatest ease I was able to obtain a specimen of the arthritic exudation, and by culture, and from examination of the centrifugalised fluid, found that the process was only subacute, and that the micrococci were being destroyed in the cells of the exudation. This information, coupled with a clinical survey of the case, decided the question of treatment in favour of non-operative measures, and the decision was justified by the result. It is not advisable to give these infants any drugs that may upset their digestion, for it is essential that they should take their food. The articulations should be protected by wool and cardboard splints.

VIRULENT SEPTIC ARTHRITIS.—Apart from the gonorrhœal cases, there are also acute forms of arthritis in young children due to virulent streptococcal and staphylococcal infections. In some cases no primary lesion can be found, in others an acute epiphysitis has involved the neighbouring articulation, in others again the arthritis is part of a general pyæmia. These are most dangerous cases, and need prompt surgical treatment.

MENINGOCOCCAL ARTHRITIS.—At the present time, with the fear of an outbreak of cerebro-spinal meningitis in our midst, this condition must be of especial interest. In London, during this winter and spring, there has been a great deal of meningitis, most of it of the post-basic type, and although none but an alarmist would term it an epidemic, I can, speaking from my own experience, certainly state that I have never met with so many cases in so short a time. Whether the post-basic meningitis is identical with the epidemic form, is a point still under consideration, but I am confident that the distinctions, both clinical and bacteriological, are so equivocal, that, in face of the dangers of an epidemic, we should be wise to consider them as identical in so far as all practical measures are concerned. Arthritis has been recorded in both forms, and several examples have come to my knowledge. Two of these deserve special mention, because they were permanent features in the illness, and not, as is usually the case, a secondary event of comparatively little moment. More than one joint in this condition may be affected, and the swelling is usually peri-articular rather than intra-articular, and sometimes almost painless. In these two cases, however, the clinical features were more striking.

I am indebted to my colleague, Dr. A. E. Garrod, for allowing me to make use of the notes of the first one which was originally under my care, but which eventually came under his supervision in the hospital at Great Ormond Street.

Case 1.—The child, a female, æt. 6 months, was the first-born of healthy country parents, and the first sign of illness recorded was that the child appeared to take no notice of anything. She had also suffered from a convulsion some six weeks before she was sent up to the hospital by Dr. Wilson of Sutton for an opinion. The point raised by Dr. Wilson was that there had been for the last week great pain on passive movement of the right arm and left leg. Looking back over the history, by the light of subsequent developments, the condition seems now most clear, but when I saw the child the cerebral symptoms were not prominent, and I failed entirely to interpret them aright. What appealed to me was the arthritic condition. The right arm was held motionless as in a pseudo-paralysis, and there was definite swelling about the left knee-joint, which suggested an epiphyseal origin.

Scurvy could be at once excluded, for the child was breast fed, and although it seemed most improbable that this was syphilitic, mercury and fixation by splints seemed the indications. Four weeks later Dr. Wilson kindly sent me the case again, and it was then obvious that this was an incorrect diagnosis, for in spite of steady treatment there had been no improvement. The child was admitted to the hospital, and the explanation unfolded itself. Screaming, blindness, head retraction, distension of the anterior fontanelle, and champing movements of the mouth were all recorded. Death ensued, and post-basic meningitis was demonstrated, together with arthritis of the left knee-joint.

The second case was not a difficult one for diagnosis, but illustrated the rare occurrence of large intra-articular rather than peri-articular effusions.

Case 2.—This child was a female, æt. 11 weeks, sent to Great Ormond Street in May 1900 by Dr. Fisher of Hornsey, with the history that seven weeks before, after a day of malaise, a purpuric eruption had appeared upon the face, body, and limbs. A fortnight of irregular fever followed, with head retraction and screaming, but there was no vomiting. Next there developed painless swellings over the lower part of the metacarpal bones of both hands, and then swelling of both knee-joints. The child was very emaciated and pale. There were ceaseless movements of the eyes, well-marked hydrocephalus, and much peri-articular swelling around the elbow-joints. Both knees *were greatly distended with fluid*, but there was no peri-articular swelling. Seven days later, Dr. Fisher informed me that the child had died, and that shortly before death all the fluid had rapidly disappeared from the knee-joints.

This case has always interested me as bearing upon the pathology of internal hydrocephalus. The distended ventricles and distended knee-joints suggested that both conditions were the result of toxins irritating the lining membranes of the respective cavities.

I would point out also the association of peri-articular and intra-articular swellings occurring in the same case and simultaneously, for it serves as a warning against a danger which I venture to think is sometimes overlooked by writers upon arthritis, that of classifying arthritic affections by the appearance of the arthritis. This has particularly hampered our study of rheumatoid arthritis. Lastly, it is interesting to recall here the neuropathic explanation of some forms of joint disease. That nervous lesions may and do much alter the course of an arthrithis, I admit, but I am sceptical of their power to produce such lesions. In the case just quoted it would clearly be a wrong explanation to claim that the arthritis was *a result of* the meningitis, though it was doubtless produced by the same infective agent.

The proof of their meningococcal origin was, I admit, not complete in either of these cases, because the meningococcus was not isolated from the arthritic exudations; but the diplococcus described by Dr. Still in this country has been demonstrated in these articular lesions, and although on these occasions this link was wanting, I feel no reasonable doubt that these were also meningococcal.

ACUTE TUBERCULAR ARTHRITIS. — French medical writings abound with information upon this condition, described under the unfortunate title of acute tubercular rheumatism. Unfortunate, because this implies that rheumatism and a fleeting inflammation are synonymous; the fallacy of which is well exemplified by rheumatic mitral stenosis.

I think it is rare in England, although most of us have seen suspicious cases of arthritis in young children which we have felt sure were tuberculous, and which have subsided under treatment with surprising rapidity.

One case has come under my notice associated with tubercular meningitis, and this combination clearly falls at once into line with meningococcal arthritis.

Case 3.—The patient, a boy æt. 5, had all the signs of a fatal meningitis, with an acute arthritis of the left knee-joint. He died, and, as in the meningococcal case recorded above, just before death the exudation disappeared. The necropsy showed a characteristic tubercular meningitis and a swollen and inflamed synovial membrane.

A very similar case to this has been recorded by Dr. Rolleston. It is most difficult to get the complete chain of evidence that this condition is tubercular, but this has been done, and inoculation of the exudation into guinea-pigs has produced tuberculosis.

Arthritis associated with Pneumonia.—Dr. Cave in this country directed our attention to the importance of arthritis associated with pneumonia. It is, I think, interesting to find how rarely we meet with this arthritis in young children. When we bear in mind the frequency with which pneumonia occurs, and not only this, the frequency also of empyema in the young, it is, I am sure, most exceptional to meet with a pneumococcal arthritis in association even with a pneumococcal empyema. Whether or not the severe pains that some children refer to their limbs at the commencement of a severe lobar pneumonia point to an arthritic and muscular infection, it is not possible to decide, for these pains pass away and have no apparent clinical pathology.

Boulloche describes a pneumococcal arthritis at the age of 5, and it may certainly occur in infancy. In any case it should be remembered that there is a decided tendency for the condition to become suppurative.

Acute Rheumatism.—Acute rheumatism is not common under 5, but it is much more frequent than is usually thought. I have notes upon thirty such cases, which I hope to make the basis of a subsequent lecture. Here I would content myself with first directing attention to that puzzling condition of stiff neck in the very young. Rheumatic stiff neck is well known, but with the current teaching before us that rheumatism is exceedingly rare under 5 years, its occurrence in a young child always raises the suspicion of spinal caries, and there may be a good deal of anxiety and doubt felt as to the nature of the condition.

These are two examples of my meaning:—

Case 4.—(1) A delicate girl of 2 years 11 months, with no immediate family history of tubercle or rheumatism, was brought to me for a stiff neck which had been noticed three months before, which had then disappeared and had then recurred during the last week. There was some rigidity of the upper dorsal spine, but no evidence of tuberculosis. The heart was greatly enlarged, and there was a double mitral lesion. She also complained of pain behind the knees. Rest in bed and salicylate treatment were successful in ridding her of the stiff neck and pain.

Case 5.—(2) R. K., æt. 6 years, was under my care for heart disease and arthritis following a sore throat, and was apparently a straightforward case of acute rheumatism. Suddenly his sister, æt. 1 year 11 months, developed a stiff neck, and could neither turn nor raise her head.

There was no tonsillitis, and no demonstrably enlarged cervical glands; no obvious arthritis or heart disease. Her temperature rose to 99°·6 F. Cautious treatment with salicylates and the local application of mesotan ended in recovery in ten days.

Acute rheumatism in young children and infants runs a more irregular course than in adolescence, and may prove rapidly fatal. Arthritis, however, may be the first symptom, and has been noticed in the majority of my cases. Two examples will serve to emphasise the occurrence of acute rheumatic arthritis in young children:

CASE 6.—J. M., æt. 3, got his feet wet through and was chilled. Within the week from this time there followed pain and swelling around the ankles, together with a sore throat and rheumatic erythema. He rapidly developed mitral and aortic disease and pericarditis, and died four months later.

CASE 7.—G. T., æt. 2 years, was noticed to be fretful and irritable, and to be suffering from a swollen ankle. Shortness of breath and rapid wasting followed, and when I saw her she had a greatly damaged heart and rheumatic nodules. This child rallied under treatment, and later was beginning to develop mitral stenosis. Unfortunately I have now lost sight of her.

ERYTHEMA NODOSUM (NODAL FEVER).—I have never to my knowledge seen arthritis associated with erythema nodosum under the age of 5 years, and it must be, I think, a rare occurrence.

ARTHRITIS OF THE TYPE DESCRIBED BY STILL.—This interesting condition has not yet been confidently labelled and pigeon-holed among the various forms of arthritis, but I shall not enter upon any discussion as to whether or not it is a form of rheumatoid arthritis, for it appears to me this only ends in substituting one unknown for another. Dr. Still's admirable description will be found in the *Transactions of the Royal Medico-Chirurgical Society for* 1896, and was based upon a study of two-and-twenty cases. His youngest was 15 months old, and eight commenced within the first three years of life. Girls were more frequently affected than boys. The onset is generally gradual, and three striking features are—(1) A chronic progressive arthritis; (2) enlargement of the spleen; (3) enlargement of the lymphatic glands. The arthritis is of the peri-articular type, and the wrists, knees, and spine are especially liable to be attacked. Pain is not a feature, but the chronic peri-articular type of the affection gives rise to much crippling. The exudation is not suppurative, and although the periphery of the cartilages may be eroded, there is an absence of bony deformity.

According to Dr. Still, the lymphatic glands that are most frequently involved are the supra-trochlear, brachial, axillary, and those in the iliac fossæ and posterior triangles of the neck. The splenic enlargement may be considerable. In none of his cases was there definite evidence of valvular disease, but, in correspondence with the grave anæmia that was present, there were in some instances hæmic murmurs. In the cases of great severity there were weeks of irregular pyrexia, and, as a rule, there was in the less severe grades a continuous mild fever. Hyperpyrexia, lasting an hour or more, was also occasionally observed.

There are other interesting details in Dr. Still's paper; but when it has been added that pericardial adhesion was found in three of the fatal cases, and that the condition is a very obstinate one, enough has been given to serve the present purpose.

The etiology is obscure, but I am convinced that they are not all tubercular, and the necropsies that I have seen myself did not suggest this origin. It might be suggested, in view of the fever and occasional hyperpyrexia, that they were meningococcal, but there is no evidence in support of this.

There are border-line cases which are well worthy of consideration by those who are interested in this form of arthritis, and one of these I will now describe:

Case 8.—A boy, æt. 4 years 8 months, had suffered since the age of four from recurrent attacks of arthritis. His mother gave a history of acute rheumatism when a girl.

When first under observation in 1901, the metacarpo- and metatarsophalangeal joints and both knees were affected. The glands in the groin and axillæ were slightly enlarged, and there was an increase in the splenic dulness. This illness was very prolonged, and further joints were attacked, including the neck and back. The heart was dilated, but there was no cardiac murmur. Emaciation became extreme. In disgust the parents took him away from my observation, and I allowed a year to elapse, when I cautiously inquired after him, thinking I should hear that he had succumbed. On the contrary, his mother told me that after four months' home treatment with cod-liver oil he had recovered sufficiently to attend school. Later, they were good enough to bring him for me to see, and I found that the large glands had disappeared, and that the splenic dulness was normal. The boy was fat. Both knee-joints were enlarged, and creaked on movement, and the cervical spine was rigid. There was considerable peri-articular thickening of the wrists. The most remarkable feature was the existence of obvious *valvular disease*. There was a long, loud systolic mitral murmur, and, with this, well-marked hypertrophy of the left ventricle.

At the end of 1902 he had another attack of arthritis, but they would not bring him up to me. In March 1903, however, he was brought very ill. His neck was swollen and stiff, and his head bent almost on to his chest. The wrists, knees, and fingers were greatly swollen, and the arms considerably wasted. His heart was greatly enlarged, and there was a long systolic murmur. The liver reached to the umbilicus, and there was ascites. His lymphatic glands were not obviously enlarged. In December 1903 he was still living, but very ill, and after this no answer returned to my inquiries.

Here, then, was a case showing many of the features of Dr.

Still's syndrome, but occurring in a child of rheumatic parentage and associated with advanced heart disease.

Arthritis associated with Hæmophilia.—This is a rare condition, and we have to do with several forms of joint affection; there may be hæmorrhage into the joints, there may be an arthritis deformans (a result of the arthritic hæmorrhage), and, lastly, there may be an infective arthritis in a hæmophilia. In children under 5, fatal hæmorrhages from the gums, from sores on the head, and from the frænum of the lips, have come under my observation, but all the arthritic hæmorrhages have occurred in children over this age.

In one case a child of 2 years nearly died bleeding from the frænum linguæ, and later from a scalp wound. Finally, at 3½ he developed a most mysterious multiple arthritis with high fever, stiff neck, and enlarged lymphatic glands.

The illness proved fatal; yet there was no trace of hæmorrhage in the affected joints, but a condition such as one meets with in acute rheumatism. This was a clear illustration of that most interesting occurrence of multiple joint swellings in hæmophilia, neither the direct or indirect result of hæmorrhage into the joints.

Congenital Syphilis.—This rarely attacks the joints at an early age, and all my own cases have been over 5 years of age, the lesions under that age being of the nature of a multiple epiphysitis. Nevertheless, we must be on our guard upon its occasional occurrence, as in Dr. F. C. Abbott's case quoted by Carpenter, in which an infant of 9 weeks, who was suffering from syphilitic epididymitis, had also a gummatous infiltration of the synovial membrane of one knee-joint. Syphilitic epiphysitis, on the other hand, usually begins in the first year of life, and often in the first six months, and may be multiple and produce separation of the epiphyses. In my experience, these cases are sometimes mistaken for multiple arthritis—a mistake which is best avoided by a most careful examination, including skiagraphy of the affected limbs, and a keen search for other evidences of the specific taint.

DEATH AND SLEEP.

By G. A. Gibson, M.D., LL.D., *Physician to the Royal Infirmary, Edinburgh.*

The rhapsody on sleep, in which Sancho Panza indulged when the Knight of the Rueful Countenance awoke him, with the strange request that he should inflict upon himself three or four hundred stripes on account of Dulcinea's enchantments, and thereby allow some vicarious relief to his worthy master, is well known to all readers of Cervantes. Smollett's translation contains a note which runs as follows:[1]—

"*There is only one bad circumstance as I have heard, in sleep, it resembles death,*—

Dulcis et alta quies placidæque simillima morti. There is a fine epigram, of which the point is a wish to die in sleep.—*Sic sine morte mori.*"

These words have long been familiar to me, and in my "Morison Lectures," on the "Nervous Affections of the Heart,"[2] they were employed to illustrate the peaceful termination of life which not infrequently occurs after anginous attacks, the *angina sine dolore* of Gairdner. When making use of these words, it seemed to me advisable to ascertain their source, but the most diligent inquiries were fruitless, and it had to be confessed that their origin was hidden from me. Towards the end of last year, however, my friend Dr. G. B. Gardiner called my attention to an interesting letter by Sir Herbert Maxwell,[3] in which, to my delight, the source of the quotation was revealed. It occurs in some lines intended to have been placed under a statue of Somnus by T. Warton, author of the "Pleasures of Melancholy," and the "History of English Poetry," who was appointed Professor of Poetry at Oxford in 1757, and Poet-Laureate in 1785. The lines are included in the Oxford Anthology,[4] where they run as follows:—

> "Somne veni, et quanquam certissima mortis imago es,
> Consortem cupio te tamen esse tori.
> Huc ades, haud abiture cito, nam sic sine vita
> Vivere, quam suave est, sic sine morte mori!"

One or two minor variations occur in different places where the lines have been reprinted, but this form is probably taken from the original. There are many translations of Warton's lines, but the most elegant is that given by Sir Herbert Maxwell in the article already referred to. It runs as follows:—

> "Come, sleep! though thou of Death the image art,
> O share my couch with me, nor soon depart;
> For sweet it is, while listless here I lie,
> Lifeless to live, and without death to die."

In a very interesting article on house mottoes, Canon Ellacombe[5] has translated Warton's lines into the following very beautiful Greek:—

> "Ὕπνε προσέρχου μοί, θανάτου τὴν εἴκονα μέντοι
> ὄντα σε σύγκοιτον βουλομαι εἶναι ἔμου—
> ἧδε μένοιο ἔλθων· τερπνῶς τὴν νύκτα πάρειμι,
> ζωὸς ἄνεθ' ζωῆς, υνήτος ἄνευ θανάτου."

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[1] "The Adventures of the renowned Don Quixote de la Mancha," translated from the Original Spanish of Miguel de Cervantes Saavedra, by T. Smollett, M.D., Glasgow, 1803, vol. iv. p. 311.

[2] *Edin. Med. Journ.*, 1902, vol. xii. p. 17.

[3] *The Spectator*, London, 1906, vol. xcvii. p. 885.

[4] "Anthologia Oxoniensis," decerpsit Gulielmus Linwood, M.A., Ædis Christi alumnus, Londini, 1846, p. 233.

[5] *The National Review*, London, 1905, No. 266, p. 287.

It is quite clear that Smollett did not grasp the true meaning of the words he quoted, which were also, in the absence of any context, not quite correctly understood by me. The obvious intention of the author was to emphasise the restfulness of sleep and the likeness it presents to the peacefulness of death. This has, indeed, been a favourite subject with the poets of every age, from Homer to Shelley. In the "Iliad" we find:[1]—

> "Ἐξ Ἀθόω δ' ἐπὶ πόντον ἐβήσετο κυμαίνοντα,
> Λῆμνον δ' εἰσαφίκανε, πόλιν θείοιο Θόαντος.
> Ἔνθ' Ὕπνῳ ξύμβλητο, κασιγνήτῳ θανάτοιο,
> Ἔν τ' ἄρα οἱ φῦ χειρί, ἔπος τ' ἔφατ', ἔκ τ' ὀνόμαζεν,"

which has thus been rendered by Pope:[2]—

> "Then, taking wing from Athos' lofty steep,
> She speeds to Lemnos o'er the rolling deep,
> And seeks the cave of Death's half-brother Sleep."

The same idea is rendered by many writers in different epochs, but is nowhere more fully expressed than in the earliest of Shelley's larger poems:—

> "How wonderful is Death—
> Death, and his brother Sleep!
> One, pale as yonder waning moon,
> With lips of lurid blue;
> The other, rosy as the morn,
> When, throned on ocean's wave,
> It blushes o'er the world;
> Yet both so passing wonderful!"[3]

It is unnecessary to add more on the subject, but as the words from Warton's beautiful lines were quoted in my lectures, originally published in this Journal, it is a pleasant duty to announce in its pages the end of my quest, and to trace them to their source.

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[1] "Homeri Ilias," xiv. 231.

[2] "The Iliad of Homer," book xiv. 268.

[3] "Queen Mab," canto i. 1.

CLINICAL RECORDS.

A CASE OF FATAL POISONING WITH BICHROMATE OF POTASSIUM.

By HARVEY LITTLEJOHN, M.B., F.R.C.S.Ed., *Professor of Forensic Medicine, University, Edinburgh.*

CASE.—Mrs. A., the wife of a joiner, was left at home by her husband at 8 o'clock when he went to his work. She had been suffering from depression of spirits for some time, but had recently returned from a month's holiday much improved in general health.

At 9.45 A.M., the neighbours heard her calling out that she had been poisoned, and on entering her house they found her vomiting at the side of her bed. The vomit was of a bright orange colour, and on a table they found a cup containing a fluid of a similar colour, and a quantity of crystals at the bottom of it. They put her to bed and sent for Dr. James Smith, to whom I am indebted for the following notes of her symptoms. He arrived at the house at 10.5 A.M., and found two women holding the patient down in bed. She was writhing in apparent agony, her face was deeply cyanosed, the eyes fixed, and the lips of a marked blue colour. The knees were drawn up to the abdomen, and the patient appeared to be in great pain. She was sensible. The skin was cold and clammy, hands and nails of a bluish colour, pulse imperceptible, and heart beats thirty per minute; the pupils were dilated. An attempt was made to wash out the stomach, but this proved impossible, owing to the jaws being firmly clenched. Within a short time the patient became quite unconscious, with gasping, slow respiration and feeble heart's action. The limbs at the same time became relaxed and flaccid, although the jaws still remained firmly clenched.

Artificial respiration was resorted to, but without effect, and the patient died at 10.55 A.M.

During the whole time that Dr. Smith was present there was no vomiting or purging, and the evidence of the neighbours confirms the fact that she only vomited on the one occasion mentioned above.

Permission was obtained to perform a partial autopsy, and accordingly this was made the same day at 4.30 P.M. The well-nourished body was still warm. There was rigidity of the muscles of the lower jaw, and also to a slight extent in the legs, but in other parts of the body *rigor mortis* was not present.

The skin generally had a peculiar dusky appearance, and in the dependent parts of the body there was marked lividity, which presented a striking brownish hue, and at once attracted attention. The face and lips were deeply cyanosed. There was no corrosion of the lips or mucous membrane of the mouth, and the latter was pale and showed no discoloration.

A small quantity of greenish matter was found to have been discharged from the bowel, and soiled the bed clothes.

On reflecting the skin from the thorax, one was at once struck with the peculiar dull colour of the exposed muscles, and, where vessels had been divided, blood of a brown colour escaped from them.

The vessels seen in the mediastinal space, and ramifying in the pericardium and on the surface of the heart, contained brown fluid blood.

The right auricle and ventricle of the heart was distended with fluid blood of a distinctly brownish colour. The left ventricle was firmly contracted, and contained a small quantity of blood of a normal colour.

Both lungs were œdematous and much engorged with blood, and on section the cut surfaces presented a greyish-brown colour. At the base of the left lung there were numerous subpleural extravasations of chocolate-coloured blood.

On opening the abdomen, the blood vessels of the omentum, and also the smaller mesenteric vessels, were seen to be filled with blood which had a marked brown colour.

The œsophagus showed no corrosion of its mucous membrane, which was perfectly normal both in colour and in other respects.

Externally, the stomach and intestines were of a greyish-green colour. There was no injection of vessels of the peritoneum, and, with the exception of the peculiar colour referred to, the external appearances of the various abdominal organs were normal.

The stomach contained 4 oz. of a yellowish-green fluid and flakes of thick mucus. The whole of its mucous membrane had a uniform green colour. It was glistening, slightly swollen, and moderately contracted into rugæ. It showed no signs of corrosion, nor of hyperæmic injection of the blood vessels.

The small intestine contained 16 oz. of fluid similar to that found in the stomach, except that it had a deeper green colour. The mucous membrane of the duodenum and intestines throughout their whole length presented the following appearances—a greyish-green colour, swelling, and in patches marked hyperæmia, the blood in the vessels being of a brown colour. There was some corrosion of the mucous membrane of the duodenum.

The liver was engorged with fluid chocolate-coloured blood.

The spleen on section was chocolate coloured. The kidneys were congested, but otherwise presented a normal appearance. The other abdominal organs showed no special features. The head was not examined.

Portions of the liver and kidneys were examined microscopically, and were found to present no definite pathological changes.

On examining the blood taken from the right auricle and also from one of the mesenteric vessels, by means of the spectroscope, it was found to show the spectrum of methæmoglobin.

The contents of the stomach were analysed, and were found to contain a small quantity of bichromate of potassium.

Poisoning by chromic acid and its salts is not very common. When the former was applied externally for therapeutic purposes in connection with morbid growths of the mouth, larynx, and genital tract in the female, more frequently than it is now, it gave rise to several fatal results. In the present day, cases of poisoning practically only occur from the accidental or suicidal administration of the bichromate of potassium. Chromic acid and its soluble salts have long been recognised as possessing extremely active toxic qualities, which depend partly on the local corrosive action exerted and partly upon changes caused in the blood and effects upon the central nervous system.

The fatal quantity of bichromate of potassium is not definitely known, but it is stated by Kobert to be 15 grs. In a case recorded by Baer of Baltimore,[1] it is stated that a man in drawing off a solution of bichromate by a syphon accidentally received a small quantity into his mouth; symptoms came on at once, and he died in five hours.

Several other recorded cases testify to its great activity as a poison. The symptoms produced are those of a violent irritant, together with the effects caused by its action upon the blood and central nervous system, more especially the respiratory centre. There is, as a rule, almost immediate vomiting, succeeded by purging, the discharged matters having a green colour due to the presence of chromic oxide, and being not infrequently mixed with blood. There is always great collapse, a feeling of coldness and cramps, with blueness of the lips and face, many cases recalling the picture of a patient suffering from cholera. In a case recorded by Stewart,[1] where a woman took nearly an ounce of the bichromate, she became unconscious in five minutes, and death occurred in forty minutes. This is the most quickly fatal recorded case, but, as a rule, death does not occur for several hours, and in these circumstances the poison is found to have exerted a marked action upon the kidneys, resulting in parenchymatous nephritis, with the presence of albumin and casts in the urine.

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[1] Taylor on "Poisons," p. 490.

The post-mortem appearances show great variation. As a rule, there are marked effects due to the local action, yellow or green coloration of the lips and mouth, with corrosion of the mucous membrane, and in the stomach and intestines a deep olive-green coloration, with varying degrees of irritation and corrosion. In some instances, when death occurs quickly, local effects are entirely absent, a circumstance of considerable interest.

Priestley[2] appears to have been the first to call attention to the fact that the blood is transformed into methæmoglobin in poisoning by means of potassium chromate, and in his paper he describes the blood of the rabbits—upon which he experimented—as being in many cases of a deep brown colour. Ruttan and Lafleur[3] have recorded a case in which the blood was chocolate coloured, and in which they obtained the spectrum of methæmoglobin.

This change in the blood, which in the case I record above formed (together with the olive-green colour of the mucous membrane of stomach and intestines) the most striking post-mortem appearance, does not seem to have been generally observed, since Kunkel,[4] in referring to Priestley's paper, says that it must be a very rare occurrence. The later work of Kobert[5] states that the blood is not infrequently brown coloured and contains methæmoglobin.

One would have expected this effect on the blood to have been much more commonly observed and commented upon, since, theoretically, the change must always occur when the bichromate is swallowed and absorbed. The explanation why it has not been more often remarked may be due to the fact of the patient having survived for a considerable time, or, on the other hand, in quickly fatal cases, to the autopsy not having been performed until a late period after death. Under the latter circumstances it is possible that the methæmoglobin formed becomes reduced, just as is the case with oxyhæmoglobin in dead bodies.

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[1] *Brit. Med. Journ.*, ii. p. 420, 1888.
[2] *Journ. Anat. and Physiol.*, London, vol. xi. p. 285.
[3] *Montreal Med. Journ.*, 1888.
[4] "Handbuch der Toxikologie."
[5] "Lehrbuch der Intoxikationen."

The features of special interest in my case are the rapidity with which death occurred, the complete absence of any staining of the mucous membrane of the mouth, and of any marked corrosive effects upon the mucous membranes with which the poison came in contact; and, finally, the very striking appearances produced by the alteration in the hæmoglobin. As regards the rapidity with which death ensued, it is almost certain that the deceased took the poison immediately before she was heard to call out by the neighbours, that is to say, at 9.45, and, according to the doctor's statement, she was dead at 10.55, or one hour and ten minutes thereafter.

A CASE OF LUPUS OF THE LARYNX SUCCESSFULLY TREATED BY THE EXTERNAL APPLICATION OF X-RAYS.

By A. LOGAN TURNER, M.D., F.R.C.S.E., *Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.*

CASE.—The patient, C. C., a girl, æt. 13 years, was sent to me by Mrs. Stewart Fowler, M.B., in the month of June 1906, suffering from huskiness of voice.

The history obtained from the child's mother was as follows:—The family history on the mother's side was good. In the father's family more than one member had suffered from cervical glandular enlargement. One of the patient's sisters, when a baby, had mastoid disease. The patient herself, when 5 years of age, had a suppurating gland under the chin, which discharged for several months. At the age of 6, she had adenoids removed. When she was 7 years old her parents noticed that the skin covering her nose was becoming discoloured; later there was destruction of the skin, with the constant formation of crusts. At the age of 9 she was admitted to the Skin Department of the Royal Infirmary, where her condition was diagnosed as lupus of the external nose. During the following three years she attended the Electrical Department, and underwent X-ray treatment for varying periods, with a very satisfactory result.

At the commencement of 1905 she had an attack of influenza, after which it was noticed that her voice was becoming husky. No advice was sought until June 1906. When she was examined at the Ear and Throat Department, on 19th June, there was marked huskiness of voice. The skin over the bones of the nose was normal, but that covering the nasal cartilages presented a thin, white, cicatricial appearance, without any broken surface. The free margin of the left ala had been destroyed to a depth of 2 or 3 mm., so that the nostrils were asymmetrical in outline. The cicatrix, however, was quite firm. The mucous membrane covering the nasal septum and the inferior turbinated bones was healthy, and showed no sign of lupoid infiltration. There was no evidence of disease upon the mucosa of the gums or lips, upon the buccal mucosa or palate, or upon the posterior pharyngeal wall. No satisfactory view was obtained of the naso-pharynx and choanæ. Laryngoscopic examination showed the epiglottis to be infiltrated along its upper free border, which also presented an irregular outline, there being a well-marked notch in it immediately to the right of the mesial plane. The mucosa covering both arytenoid cartilages was slightly infiltrated; the true cords were thickened and irregular in outline, there being a nodular infiltration more or less limited to the posterior parts of the cords. There was no pulmonary mischief, and the patient enjoyed fairly good health.

Although one is obliged to admit that no infiltrated tissue was removed for microscopic examination or for the inoculation of a guinea-pig, and that no tuberculin reaction was sought for, we have no hesitation in saying that the clinical history and the appearances presented by the diseased parts were sufficiently confirmatory of the lupoid nature of the affection. When the skin covering the nose had been affected, no doubt was held as to the question of it being lupus. In order to submit the case entirely to X-ray treatment, I did not wish to interfere with it in any other way, therefore no tissue was removed for examination or for animal inoculation.

My attention was directed to the treatment of lupus of the larynx by the external application of the X-rays, after reading an account of a case treated in this way by Dr. H. S. Birkett of Montreal (*Trans. Am. Laryng. Assoc.*, 1904–1905). In discussing the question of the treatment of laryngeal affections of this nature by the rays, prior to the publication of Birkett's paper, one was always met with the statement that their application through the cartilages of the larynx would not be followed by any curative action upon the disease, while the risk of irritating the skin covering the larynx by the X-rays was very considerable. Encouraged by the result obtained by Birkett in his case of lupus of the pharynx and larynx, I asked Dr. Dawson Turner if he would kindly undertake the treatment of the patient, and I wish to express my indebtedness to him and to the staff of the Electrical Department of the Royal Infirmary for the trouble and care which they have taken in the matter.

The case seemed specially suitable for such treatment, as the disease was limited and the child's mother was prepared to give the time and attention necessary for it. Treatment, therefore, was commenced in the first week of June 1906, and it was systematically carried out for a period of twelve months. Three sittings were given each week during that time, the patient attending regularly at the Infirmary. The X-rays were applied through a focus tube over the skin covering the right side, middle line, and left side of the thyroid cartilage alternately at consecutive sittings. This alternation was maintained during the whole period of treatment, and at no time was any irritation of the skin produced. Each application lasted from five to ten minutes.

The patient did not again present herself for laryngoscopic examination until June 1907, so that I was unable to observe the gradual changes which took place in the larynx. At the end of one year of treatment, however, one was able to satisfy one's self of its success. The hoarseness had disappeared, the voice being clear and strong. The epiglottis was firmly cicatrised, a V-shaped notch being visible in its free border to the right of the mesial plane. The mucous membrane covering the arytenoid cartilages and the vocal cords presented a normal, healthy appearance. It will be necessary to keep the patient under observation, but the success attending this case is an encouragement to carry it out in others. The prolonged nature of the treatment is certainly a disadvantage, but it is possible that a shorter period might have sufficed in this case had the larynx been examined at intervals during the application of the rays.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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A Text-Book of the Diseases of Women. By J. CLARENCE WEBSTER, M.D., F.R.C.P.Ed. Philadelphia and London: W. B. Saunders & Co.

IN his text-book of the diseases of women, Professor Clarence Webster presents a clear and comprehensive view of modern gynæcology in all its branches. The manner in which the contents are arranged will commend itself to British readers. A full description is given of the pelvic anatomy, the structure of the pelvic floor being well explained. The value of the levatores ani as strengthening agents to the pelvic floor is here shown to be small as compared with the action of the pelvic fascia. as is undoubtedly the case. After reading the correction of the common misconception as to the course of the fibres of the levator muscles, one is surprised to see Fig. 77 being used, the fibres there being represented as running toward the middle line. The increasingly important subject of the bacteriology of the genital tract is dealt with in a separate chapter, the gonococcus receiving the pre-eminent position to which its havoc entitles it. For making gynæcological examinations the author recommends the invariable use of rubber gloves, which will meet with the general approval of those who have given them a trial. The details of preparing patients for operation is minutely gone into, and if all the precautions described are carried out, the operator might well be excused for feeling aggrieved if his patient failed to keep aseptic. The use of clove oil is advocated in the preparation of the hands, the process being as follows: The hands are scrubbed with soap and hot water for five minutes, dried and immersed in alcohol for one minute, and when dry they are bathed in clove oil for five minutes, and the oil then washed off in alcohol. Sterilised talc powder is then applied, and dry rubber gloves put on. Under surgical technique emphasis is placed on the importance of preserving the peritoneum from damage which may lead to subsequent adhesions. When drainage is required, the author prefers the vaginal route, and uses chinosol gauze in preference to iodoform. In dealing with affections of the vagina and vulva, the value of formalin as an application and in the douche is noted. It acts very satisfactorily in vulvitis, and might with advantage be used in this country more than it is. The following prescription is recommended for application in vulvitis: —℞ Formalin, 10–25 minims; glycerini, 6 oz.; water, 14 oz. In the operative treatment of chronic ovaritis conservative measures are recommended. In 5 per cent., however, of the author's cases of resection of the ovary, he has required to operate again in a year to remove the rest of the ovary. The method of internal shortening of the round ligaments by stitching them to the posterior wall of the uterus, as devised by the author, is recommended as the most applicable to the majority of cases of backward displacement requiring operation. An interesting illustration is given of a uterus with suspensory band attached, the uterus having again become retroverted after ventro-suspension. The chance of this state of matters occurring would make one prefer the shortening of the round ligaments to ventro-suspension as the operation for retroversion. The subject of ectopic gestation is treated in the able fashion which is to be expected from one whose researches on that subject are so well and widely known. The author also describes and illustrates his case of ovarian gestation. The volume throughout maintains a high standard of excellence. In reading it one feels that the writer is always speaking from his own experience and from personal observation. The illustrations are profuse and, on the whole, well chosen, and one can have no hesitation in recommending the book as a thoroughly reliable guide to the subject, and one which is bound to take a leading place among the treatises on gynæcology which have appeared with such frequency of late years.

A System of Medicine. Edited by THOMAS CLIFFORD ALLBUTT and HUMPHRY DAVY ROLLESTON. Vol. ii. Part 1. London: Macmillan & Co. Ltd.

THE editors are to be congratulated on the step they have taken in dividing the second volume of the "System" into two parts.

The scope of the various subjects treated in the original volume, together with the large amount of new matter requiring to be introduced into many of the articles, and the wise determination to consolidate the subjects of tropical diseases and animal parasites into one volume, fully justify the subdivision referred to.

Part 1 of Volume ii., which is before us, opens with an admirable article by Professor James Ritchie on the general pathology of infection, which occupies two hundred pages, and deserves the highest praise for the clear and complete manner in which the present state of knowledge in regard to the pathology of infection is reviewed.

Another new article is that by Mr. Foulerton on streptothrix infections, while Dr. M'Vail writes upon vaccination as a branch of preventive medicine in place of the late Mr. Ernest Hart.

The transference of syphilis from its former position under diseases of "uncertain bacteriology" was inevitable in view of recent discoveries in regard to its etiology, and it is now included amongst those the bacteriology of which is held to be established.

These and other changes of like character indicate that this edition, while maintaining the features which proved so popular on the first appearance of the "System," has been edited with judgment and due consideration of the progress of scientific research.

A word of special praise must be said with regard to Dr. Oliver's article upon "Metallic and Other Poisons." It is true that he deals more particularly with the trade or occupational aspects of poisoning, but this is exactly what in our opinion the majority of readers of the "System" will find most useful. Information in regard to cases of acute poisoning occurring in general practice can be obtained from any work on forensic medicine, but there are few books which give an accurate account of industrial poisoning, and certainly there is no authority in this country with such an extensive experience on the subject as Dr. Oliver.

The Practice of Obstetrics by American Authors. By Reuben Peterson. London: Henry Kimpton.

As might be expccted in a work compiled by a number of different contributors, there is considerable inequality in the merit of the various sections of which it is composed, but on the whole the editor is to be congratulated on the production of an extremely full and up-to-date text-book, which must prove useful to medical practitioners from a reference aspect.

The initial chapters on the physiology and development of the ovum discuss this debatable subject with great fulness; the author here maintains that menstruation indicates ovulation without fertilisation, and entirely ignores the more freely accepted views of Pflüger. The physiology and diagnosis of pregnancy is very practically considered; it seems, however, that pulsation in the fornix vaginæ as a sign of early gestation does not get the prominence it deserves. The chapters on the pathology of pregnancy and of the fœtus are most excellent. The designation of hydatid mole as syncytioma benignum is novel and to the point. Extra-uterine pregnancy commands a section to itself. Here the author does not seem to sufficiently differentiate between complete and threatened tubal abortion, the latter probably being the commonest course of ectopic pregnancy. Uterine contractions are not mentioned as a valuable point of differential diagnosis between intra- and extra-uterine pregnancies. The theories given for explaining precipitate labour are weak compared with that of a painless labour, which it doubtless is. The delivery of the after-coming head in a breech case occiput first as recommended, is surely unscientific at any time. The strong approval of axis-traction forceps is greatly to be commended. That they cause compression of the fœtal head is difficult to understand; indeed, the absence of compression is one of the strongest advantages of the instrument. Exception might also be taken to the transverse position of the head being a contra-indication to forceps, as from the experience of many reliable obstetricians it has been shown to be safer to the child than turning. The section on the management of the new-born is most practical and valuable. The illustrations are quite a feature of the work. The greatest exception to the work is its unwieldy size, which might be rectified with advantage in future editions by its publication in two volumes.

Atlas of Applied (Topographical) Human Anatomy. By Dr. Karl von Bardeleben and Prof. Heinr. Haeckel. English Adaptation from the German by J. Howell Evans, F.R.C.S. London: Rebman Ltd.

The author expresses the hope that this atlas will serve as a means of revision among students, as a valuable reference of applied anatomy to the practitioner, and as a means of quickening the weakening memories of the surgeon!

In the selection of the plates special attention has been directed to those regions which have, of recent years, become of increased interest to the physician and surgeon. The book, while not intended to replace the ordinary text-book of anatomy, is greatly impaired as a work of reference because of the absence of an index. The plates, which are partly lithographs and partly wood blocks, are by no means so artistically turned out as in some other atlases which have been recently published, but they are good enough for the purpose, and many of them illustrate views of the various regions and structures of the body from an original standpoint. Some of the plates are apparently inaccurate; for example, Fig. 4, which illustrates the lateral aspect of the cerebral hemisphere, depicts the motor areas as being spread over both ascending convolutions; Fig. 61, which depicts a complete dissection of the deeper layers on the anterior aspect of the neck, figures the left internal jugular vein as running downwards parallel with the carotid artery instead of inclining towards the middle line at its lower part; and the same mistake is made in Fig. 113, which illustrates the structures entering the upper aperture of the thorax; Fig. 125, which is intended to illustrate the position of the abdominal viscera as seen from behind—after Luschka—shows the kidneys to lie *outside* the tips of the transverse processes of the lumbar vertebræ.

The translator has done his work well, considering the difficulty of giving an accurate English version of an anatomical work written in German, but one is surprised to find places where the English is faulty and where the anatomy is incorrect. The following sentence from the page facing Fig. 128 is an illustration of such a departure: "The small omentum, in the removal of the stomach, should not be cut at too great a distance from the lower curvature, because the branch of the left vagus distributed to the stomach and the liver would be injured and the function of the liver be damaged."

Among the plates deserving special commendation are those illustrating the anatomy of the gall bladder and bile ducts in their relation to the duodenum and pancreas; the cæcum and appendix and the sigmoid colon; the anatomy of the male perineum, one of these giving an excellent illustration of the recto-urethral muscle; the anatomy of hernia and of joints, while throughout the whole volume most useful illustrations of the regional distributions of the lymphatic glands. While we have ventured to draw attention to certain minor defects in this atlas, we have no hesitation in expressing the view that it will be found to be of inestimable value to the practitioner.

The Treatment and Prophylaxis of Syphilis. By Alfred Fournier, Professor at the Faculty of Medicine of Paris. English Translation of the Second Edition by C. F. Marshall, F.R.C.S., formerly Resident Medical Officer to the London Lock Hospital. London: Rebman Ltd.

The translator draws attention to the fact that up to the present time only one of Professor Fournier's works has been translated into English, namely, "Syphilis and Marriage," which was published in 1881, and he believes it to be due to the absence of translations that facts which were fully explained by Fournier a quarter of a century ago are apparently little known in England except among a few specialists, and are almost entirely ignored in the text-books. In spite of the well-known repugnance of an Englishman to learn and read a foreign language, we hardly thought that Professor Fournier's views are so little known in this country as the translator would have us believe; from our student days onward we have always heard of Fournier as one of the greatest living syphilographers, and his views have always been brought before the students in the Edinburgh Medical School.

The introductory chapter deals with the necessity of treating syphilis as a constitutional disease, in contradistinction to the treatment of syphilitic lesions which is alleged to be the chief aim in hospital practice. It is only in private practice that it is possible to treat syphilis properly, because by following the cases right through we are in a position to judge of the effect of different methods of treatment over long periods. It is mainly what Fournier has learned in private practice that is discussed in the present work.

The author has never seen any appreciable difference between the syphilis derived from a chancre and that derived from a secondary lesion. It is a matter of common observation, that tertiary lesions of the most severe nature often follow the smallest, least indurated, most benign and most insignificant chancre. This is because the chancre only represents the resistance of the organism at the time of infection; it is no criterion of what the resistance will be in the future. Syphilis which begins well may end badly. Out of seventy-eight cases of cerebral syphilis observed by the author, seven followed a secondary period with severe manifestations, while seventy-one were preceded by benign secondary symptoms. Nine times out of ten, tertiary lesions ensued from syphilis which was originally benign. It is therefore necessary to treat syphilis from the outset, however benign it may appear to be.

The abortive treatment of syphilis is discussed at considerable length, and the conclusion is arrived at, that while there is little or no hope of preventing constitutional infection by the cauterisation or excision of the primary lesion, one is justified in doing so when the conditions are favourable.

With regard to the general treatment of syphilis, stress is laid upon the view that the whole treatment of syphilis is not contained in the administration of mercury and iodides, but on what he calls auxiliary medication, intended to modify the conditions of health which may coexist with syphilis, and on hygiene. The habits, diet, and mode of life require careful supervision.

Of anti-syphilitic remedies proper there are only two—mercury and iodides. The public of to-day bears malice against mercury in remembrance of the past. Mercury exerts an undoubted preventive action on the manifestations of the secondary period, and also on those of the tertiary period. Of a hundred cases of cerebral syphilis, only five had been efficiently treated with mercury. The choice of the method of administering mercury cannot be determined in a general or abstract manner; it is subject to the necessities of practice, to special circumstances, and to individual considerations. Everything is subordinate to the indications of the particular case, and these indications must always be obeyed.

Owing to its powerful therapeutic effect, inunction is preferable to all other methods in severe cases, in cases which do not yield to mercury given in other ways, and in syphilis occurring in young subjects. The method of intramuscular injection, while occasionally useful, is the least practical of all for the routine treatment of syphilis.

The author regards the buccal or stomachic method as the best routine method. With regard to the dose, he believes that mercury is not administered in sufficient amount. There is an actual fear of it not only on the part of the patient, but often on the part of the physician. The dose must be proportioned to the manifestations of the disease and to the idiosyncrasies of the patient. The dose must be determined in each case by observation, gradually increasing it until the gums are slightly touched, and then settling down to an amount just short of this.

The rôle of iodide of potassium is fully considered. According to the author, it was Wallace of Dublin who, in 1836, first published, in the *Lancet*, the results which he had obtained with the new remedy. It was then taken up by Ricord, who recognised its particular application to the lesions of the tertiary period.

Fournier is an enthusiast in regard to iodide. "Without the least exaggeration it may be called a marvellous remedy, sometimes working miracles." Iodide exerts to the full its anti-syphilitic action even when it has not been preceded by mercurial treatment. It is therefore by itself a powerful anti-syphilitic, and produces its beneficial results without injury to the general health. Fournier gives a warning against the popular view that when a given dose of iodide causes symptoms of iodism it should be doubled or trebled, inasmuch as grave complications such as œdema of the glottis may rapidly supervene. He estimates the dose for an adult man of good constitution and average strength as 45 grs. in the twenty-four hours, and for an adult woman in the same condition 30 grs., but he begins with smaller doses—30 grs. for a man and 15 for a woman.

Chapter xxi. deals with what he calls the mixed treatment, mercury and iodides being combined, which is especially beneficial in the numerous lesions which occupy the borderland between the secondary and tertiary periods, and especially in cases of cerebral syphilis. Fournier believes that the separate administration of the two drugs is more convenient in practice and much more active.

At the last interview, when our patients pose the inevitable and perilous question, "Am I cured?" we should never neglect to express our undisguised opinion, and give the following salutary and essential advice:

"Yes, I believe you are cured; but whatever may occur in the future, whatever disorder may affect your health, remember your former complaint. Never neglect to inform your physician of your special antecedents. Tell him plainly, tell him ten times rather than once, that you have had syphilis. It is quite possible that this information may be of no value to him, but it is not impossible that circumstances may occur in which this information may be of capital importance both to him and to you, and on your confession of your antecedents may depend your chance of cure, or even your life."

A Course of Lectures to Midwives and Maternity Nurses. By W. E. Fothergill, M.A., B.Sc., M.D., Lecturer in Obstetrics, Victoria University of Manchester. Edinburgh: William Green & Sons.

This book is divided into two parts. The first deals with normal pregnancy and labour. The opening lecture on the chief duty of midwives and maternity nurses refers to the great importance of protecting their patients from the dangers of puerperal fever. The mechanism of labour in vertex presentations is very clearly written, and we think the author is right in omitting any detailed description of the mechanism in abnormal cases. The second portion of the lectures refers to the subject of securing medical assistance in all conditions which endanger the patient's health or life. Thus the signs and symptoms which give warning of such conditions as deformed pelvis are fully described. In the chapter dealing with the hæmorrhages before and after labour, special reference is made to the treatment of post-partum hæmorrhage by compression of the aorta, and a very good diagram makes clear to the nurse the arterial supply of the uterus. All the illustrations are good, but we think it is unnecessary in a text-book for midwives to include diagrams of frozen sections made in the different stages of labour. The book will be found a very reliable guide to maternity nurses, especially for those who purpose taking the diploma of the Central Midwives' Board.

Cancer of the Womb: its Symptoms, Diagnosis, Prognosis, and Treatment. By Frederick John M'Cann, M.D. (Edin.), F.R.C.S. London: Henry Frowde and Hodder & Stoughton.

This book forms one of the most important volumes of "The Oxford Medical Publications." It gives a concise account of the symptoms, diagnosis, and treatment of cancer of the uterus. Each type of cancer as it occurs in the womb is illustrated by one or more cases from the author's own clinical experience. He does not think that lacerations of the cervix are of great etiological importance. In the chapter on "Spreading of Uterine Cancer," Dr. M'Cann rightly points out that mobility of the uterus does not always mean absence of involvement of the parametrium, or that interference with its mobility is a certain test of parametric invasion with cancer. Reference is made to the combination of myoma and carcinoma. The author emphasises the great responsibility practitioners incur in allowing any opportunity to pass of diagnosing cases in the early stage, as it is to the general practitioner that we must look for promptness in getting suitable cases surgically treated. Dr. M'Cann finds the uterine sound of use in diagnosing cancer of the body of the uterus, as by it elevations and depressions of varying consistence may be felt, and its withdrawal produces an abnormal amount of hæmorrhage. He also recommends that scrapings for diagnostic purposes should, if possible, be obtained by the use of the curette without preliminary dilatation. When the cervix requires wide dilatation, the author prefers incision through the anterior uterine wall in the middle line, as he believes that large dilators do not dilate but lacerate uterine tissue. He does not approve of scraping the diseased cervix previous to the operation of vaginal hysterectomy, as this may favour the spread of septic infection, and, perhaps, disseminate the disease. The importance of protecting the ureters is referred to. This he does by freeing the bladder from its lateral attachments before dividing the tissues which unite it to the cervix. Statistics of results of operative treatment are given chiefly from continental sources. With regard to the "extended abdominal operation," as carried out by Wertheim, the author believes that the time has not yet arrived for giving a final verdict, but he is not in favour of the extensive "dissection operations" advocated by some authorities. As he correctly points out, the value of Wertheim's operation is not in its extensive glandular dissection, but in free removal of the parametrium and upper part of the vagina. In inoperable cases opium is given as still the best drug to relieve pain. The chapter on "Deciduoma Malignum" is well written, and includes a description of a most interesting case occurring eighteen months after the menopause. When referring to the after-treatment of operations, the author expresses his approval of rapidity in operating, as every minute after an hour of anæsthesia is of importance. When drainage is employed, he thinks it is a mistake to draw off the fluid, which is better left in the abdomen. This will not receive universal acceptance, although we agree with him that washing out the abdomen may spread infection rather than remove it, and that the pelvic cavity is best cleaned by gauze sponges. Dr. M'Cann is a firm believer in giving solid food at the earliest possible date after operation, as the bowels then act naturally in four or five days. He further believes that the amount of actual nutriment derived from so-called nutrient enemata is *nil*, but he strongly recommends the use of saline injections after abdominal operations. The work is illustrated throughout by original photographic plates, most of them showing the naked-eye and microscopic appearances very clearly. The book is one of great merit. It will be read with interest both by the specialist and general practitioner as an authoritative exposition of the important subject with which it deals.

A Text-Book of Genito-Urinary Diseases. By Dr. Leopold Casper Translated and edited, with additions, by C. W. Bonney, M.D. London: Rebman Ltd.

Dr. Leopold Casper, Professor in the University of Berlin, is a recognised authority upon genito-urinary diseases, and it is a matter of congratulation that his views have been made accessible to English-speaking surgeons by the translation of his text-book upon this subject by Dr. C. W. Bonney. The translation has a foreword from the author of the work, in which he says Sir Henry Thompson first led him into this realm of genito-urinary diseases, and he "trusts that Sir Henry's teaching fell upon fertile soil." We have no hesitation in affirming that it did, as Dr. Casper's book is excellent both from the scientific and practical side. It is a most suggestive work, full of originality and luminous in its teaching. We have read it from cover to cover with much pleasure and profit, and believe that it is thoroughly sound and an admirable guide for the practical surgeon. The author writes in the happiest manner, simply and without padding. The subject is brought before the reader in a most attractive form, and is wholly up to date, while the illustrations and plates are clear and appropriate to the text. Debatable points are fairly stated; and although the author does not hesitate to give his opinions quite definitely, yet he does so with such moderation that even those who may disagree with them must admit the fairness of his conclusions. Dr. Casper has been a pioneer in some, and an early follower in others, of the more recent advances in genito-urinary surgery, and throughout his book he gives ample evidence of the important part recent clinical methods have had in placing this branch of surgery upon a sure scientific basis for practical work. These new methods are clearly described, and their uses fully shown. The author draws from a long and wide experience, and his opinion is of much value. Those who are unfamiliar with, or who disbelieve in, *urethroscopy*, *cystoscopy*, or *ureteral catheterisation*, would do well to read this work, in which, in a most convincing manner, their value is shown.

The space, less than a hundred pages, devoted to diseases of the kidneys, is not relatively proportionate to the importance and scope of the subject; but, as far as the author goes, this section is accurate and up to date. Some time, we trust, he will incorporate his experience in a larger work. We observe there is no reference to decapsulation of the kidney in the treatment of nephritic conditions, as advised by Edebohls, but very probably that surgeon's papers have not convinced Dr. Casper that the method is deserving of notice. Functional disturbances of the sexual organs are treated in a practical and concise way, and this part of the work well repays perusal. The views are not new, but the subject is put before us in a more acceptable form than is frequently the case.

Dr. Bonney has placed a most readable book before the profession, and deserves much credit for his share in the work, which has been carried out in intimate association with Professor Casper.

Atlas and Text-book of Human Anatomy. By Dr. SOBOTTA. Edited by J. PLAYFAIR M'MURRICH, M.D. Vol. II. London: W. B. Saunders & Co.

THE second volume of Sobotta's Anatomy maintains the high standard of excellence which was reached in the first volume, a review of which appeared in a previous number of this Journal. The mode of reproduction of the dissections is similar to that in the first volume, and the autotypes, multicoloured lithography and three-coloured process, give excellent results; indeed, the accuracy and clearness of the 214 illustrations could not easily be surpassed. The letterpress is ample, and brings before us in a readily understood manner what the illustrations so graphically depict. We note that the author retains the older description of the colon and rectum, but the more recent work upon the valvular folds of the rectum are described and figured. The pages and illustrations devoted to the peritoneum bring that somewhat difficult subject interestingly and lucidly before the student. With so much to praise in this work, it may seem captious to criticise minor errors, but with more care the incorrect references to pages and illustrations could have been avoided, and the figures 515 and 516 would not have been printed upside down. It is a pleasure to bring this work favourably before the profession, as we believe it to be thoroughly reliable and excellently adapted for the needs of the practitioner and student.

NOTES ON BOOKS.

IT is not necessary to do more than chronicle the appearance of the fifth edition of Da Costa's *Modern Surgery, General and Operative* (W. B. Saunders & Co., Philadelphia and London, 1907). Each edition of this work sees a marked increase in its size, due, for the most part, to the incorporation of extracts from recent papers. These additions are not always selected with discrimination, and many of the extracts are of a length out of all proportion to their importance or value. A judicious use of the pruning-hook, particularly in the sections dealing with general surgery, would materially increase the value of this work to the student. The illustrations are numerous, and the index full.

No better résumé of the year's work appears than that contained in "The Practical Medicine Series" (G. Gillies & Co., Glasgow). The volume devoted to *General Surgery* has again been edited by Dr. John B. Murphy, and it contains the gist of all the important papers that have appeared during 1906. In the introduction the editor indicates the general trend of surgical progress, as manifested by the contents of this volume; and it becomes evident that "biology and chemico-biological knowledge are rapidly advancing in their practical preventive and therapeutic results," and that "the fluids of the body . . . are assuming a very important rôle, as shown by their opsonic properties." While the surgery of cerebral neoplasms has advanced but little, the results of early drainage of intra-cranial infections have materially improved. The following sentence, which we quote verbatim, is evidently for home consumption: "It seems that the time for legal recognition of and punishment for delay in diagnosis and operation for appendicitis is due, and, unless the profession awakens to its shortcomings, an enactment will soon be placed on our statute books." We can confidently recommend this publication to all who desire a readable summary of the literature of surgery issued in 1906.

In preparing the third edition of her *Lessons on Massage* (Baillière, Tindall, & Cox, London), Mrs. M. D. Palmer has revised the whole text, and entirely rewritten the sections on lateral curvature of the spine, flat-foot, and wry-neck. After a brief, but admirably clear, exposition of the theory of massage, and a description of the manipulations employed, the anatomy of the various regions of the body is described—sometimes in more detail than seems necessary, but always in such terms as to render it intelligible and useful to the student of massage. In separate sections, the manipulations appropriate to individual regions, and for different affections, are fully described in such a way as to make the rationale of the treatment easily understood. A short chapter on bandaging has been added for the benefit of the masseuse who is not a trained nurse, and a useful glossary serves to explain the technical terms employed in the text. The work is illustrated by well-executed photographs and drawings. We can confidently recommend this work to the student of massage.

Some Points in the Surgery of the Brain and its Membranes (Macmillan & Co., London) is based upon the Lettsomian Lectures delivered by Mr. Charles A. Ballance before the Medical Society of London in 1906. The subject-matter is arranged in three sections, the first dealing with the membranes of the brain, the second with cerebral abscess, and the third with cerebral tumours. Much of the literature on each of these subjects has been consulted and epitomised, but we miss references to some of the most notable contributions to the surgery of the brain, particularly those of Macewen. The valuable work of the Philadelphia school of neurologists and cerebral surgeons receives due recognition. While the work contains no important addition to our knowledge of cerebral surgery, it furnishes a readable résumé of what is at present known.

So many new drugs and other preparations to subserve various purposes in medicine appear in rapid succession from German chemical laboratories, accredited with special virtues not always confirmed by subsequent experience, that some definite pronouncement, in a handy form, as to their nature and applicability is from time to time necessitated. Ledermann—*Die Therapie der Haut- u. Geschlechtskrankheiten* (O. Coblentz, Berlin, 1907)—has provided this in so far as it bears on skin and venereal affections. His book—of which this is the third edition—is an accurately compiled work of reference, in which there is no unnecessary waste of language. After a brief allusion to the general hygiene of the skin, he turns to the several methods in use for mechanical treatment, methods which have received considerable accessions in recent years. The internal treatment does not occupy much space, but the external is fully dealt with. First the modes in which the substances employed can be blended, whether as baths, powders, or in combination with excipients of all kinds and descriptions, and the indications for their selection, are most carefully gone into. The criticism to which they are individually subjected seems fair and well balanced. The remainder, amounting to about one hundred pages, deals with the management of the more important skin diseases, of the soft sore, syphilis, and gonorrhœa. While in many cases the instructions and the cautions are full and sufficient, in others they are decidedly scanty, and will only serve to refresh the memory, hardly to provide directions ample enough apart from previous knowledge acquired from experience, or from consulting a larger text-book. It is eminently a book to lie on the desk within easy reach, offering an abundant choice from a large number of suggestive formulæ.

This volume—*Transactions of the American Surgical Association*, vol. xxiv. (Dornan, Philadelphia)—which is edited by the Recorder of the Association, Richard H. Harte, contains an unusually large number of interesting papers. The meeting, which was held at Cleveland in June of last year, was a very successful one.

It would be invidious to make any selection of papers from the present volume, but among the authors may be mentioned Trendelenburg, the Brothers Mayo, Cabot, Pilchar, Ballance, Shepherd, Ochsner, Cushing, Deaver, Coley, Roswell Park, and Bloodgood.

The volume contains a large number of excellent illustrations.

The present volume of *St. Thomas' Hospital Reports*, vol. xxxiv. (J. & A. Churchill, London), edited by Dr. H. G. Turney and Mr. W. H. Battle, resembles its predecessors in consisting chiefly of the reports of the individual departments of the hospital and of additions to the museum, these accounting for over 500 out of a total of 637 pages. The remainder is made up of papers on "The Diagnostic Value of Cammidge's Pancreatic Reaction," by Dr. Cassidy; "The Regional Frequency of Fractures of the Spine," by Mr. Horner; "The Lesions which result from the Execution of Criminals," by the same author; "The Lesions in Acute Diphtheric Toxæmia, more especially in relation to Acute Cardiac Failure," by Dr. Dudgeon; and tabular statements of the cases of gastro-enterostomy performed at the hospital from 1891 to 1896. These tables are interesting, as they show the evolution of the operation over a period of fifteen years; the mortality, which began as 100 per cent., has gradually been reduced to 22 per cent., which is of course unduly high, but is partly explained by the operation having been performed in many cases for advanced malignant disease.

There is also an obituary notice and portrait of the late Mr. Croft, surgeon to the hospital.

One looks for and is certain of finding in the *Transactions of the American Dermatological Association* (Twenty-ninth Annual Meeting, held in New York, 1905) a record year by year of many interesting cases and of much progress. In the volume before us not a small space is devoted to various aspects of the X-rays, regarding which, if the novelty has in a measure passed off, the more solid residuum remains. Stelwagon, in the light of wider experience, reviews his former conclusions. Some sound rules are laid down as to vacuum, degree of action, character of exposure, and distance from the tube. He utters a salutary warning against their indiscriminate use, or their employment to the exclusion of other well-tried measures. White and Burns record an example of severe mycosis fungoides, which advanced rapidly and ended fatally with pyrexial phenomena, subsequent to a series of extensive exposures to the X-rays. Whether the fatal issue was wholly due to toxic causes from undue charging of the system with products of retrograde metamorphosis, seems a moot question. At the same time, it suggests the advisability of greater caution during the tumour or ulcerative stages, than in the premycosic period of the disease. So far their effect is more particularly an inhibitory than a curative one. Epidermolysis bullosa, or a congenital weakness of the skin, rendering it liable to the development of bullæ on slight provocation, has from its peculiarity been pretty carefully investigated, and its general morbid histology fairly accurately determined. But Engmann and Mook point out, from cases examined by them, the almost entire deficiency of elastic tissue in the papillary and deeper part of the corium, and its very scanty presence in the lowest portion of all. Since this element has been regarded as forming the framework of the skin, its absence must mainly contribute to its vulnerability. We may advert to the possible indication that this affords of the applicability of the X-rays as a therapeutic measure, from their known power, in certain cases at any rate, of stimulating the reproduction of elastic tissue when shown to be deficient.

This volume—*Transactions American Gynæcological Society*, vol. xxxi. (Dornan, Philadelphia)—contains the papers read before the Society during the year 1906, with the discussions which followed their reading. Of outstanding interest and importance are the papers on the best methods of dilating the gravid uterus. This subject included a discussion on incision *versus* dilatation of the pregnant uterus. Other important contributions are those on the development of cancer in the cervical stump after hysterectomy, and on the parametrium in cancer of the uterus, with its clinical significance. So long as the *Transactions* maintain the standard of this volume, the high position which it occupies in gynæcological literature is assured.

Fothergill's *Manual of Midwifery* is now so well known, that we need do little more than announce the appearance of another edition (fourth) (William Green & Sons, Edinburgh, 1907) after an interval of four years. The present edition contains a considerable amount of new matter, and that which previously appeared as an appendix now finds its place in the book. Several sections have been rewritten. That on ectopic gestation includes a short description and illustration of van Tussenbroek's case of ovarian pregnancy. The chapter on obstetric operations contains no reference to pubiotomy, but that on artificial dilatation of the cervix is more fully described than in previous editions. No doubt this edition will have the same success as it has hitherto enjoyed. It is a clear and condensed manual of obstetrics, which will continue to prove of great use to students of this department of medicine.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Nervous Diseases.

Sleeping Sickness and its relation to General Paralysis.—Spielmeyer (*München. med. Wchnschr.*, 1907, May 28) has an interesting and suggestive paper on this subject. He first discusses the symptomatology of sleeping sickness, and points out that although its clinical manifestations have not been exhaustively studied, they apparently present many analogies to those of general paralysis. Beginning with psychical affection,—feeling of exhaustion and incapacity, followed by apathy, somnolence, and failure of mental power,—the malady is attended in its later stages by physical nervous symptoms—tremor, indistinct articulation, alterations of the reflexes, paresis, and terminal epileptiform seizures. Another sign common to both sleeping sickness and general paralysis is lymphocytosis of the cerebro-spinal fluid. Turning next to the pathological changes, the characteristic lesion, first discovered by Mott, and confirmed by all later observers, is chronic meningo-encephalitis—a diffuse meningeal and perivascular infiltration with small and medium-sized mononuclear leucocytes, and a few plasma cells. In its peculiar histological features, then, sleeping sickness resembles general paralysis. Struck by these points of similarity, Spielmeyer has sought for further analogies between the two diseases. His investigations concerned the organs of four cases of human sleeping sickness, and of apes infected with *Trypanosoma gambiense.* He finds that in their broad outlines the pathological changes in the two diseases resemble each other pretty exactly, but that there are sufficient differences to admit of microscopic differentiation in most cases. The chief distinguishing points are a more widely spread distribution of plasma cells in all the organs, and a tendency of these cells to wander from the lymph spaces of the adventitia into the parenchyma of the nervous system in trypanosomiasis. Common to both, on the other hand, are the diffuse infiltration of the meninges and vessels with plasma cells, the proliferation of the endothelium and adventitia cells, the degeneration of the nerve elements, and the increase of neuroglia. These resemblances between sleeping sickness and general paralysis acquire fuller significance when we compare trypanosome infections in general with syphilis. In dourine we have a malady of horses due to a trypanosome, which is very like syphilis both in its mode of propagation, its symptoms, and the lesions of the nervous system. Spielmeyer found granulomatous tumours indistinguishable from gummata, and changes in the vessels and lymph spaces of the brain and cord, very like those of syphilis. In human trypanosomiasis infection sometimes results in an illness attended by fever, sometimes in sleeping sickness,—why this should be so is not known, but it is possible that there may be a virus with a special affinity for the central nervous system, just as we suppose that some forms of syphilitic infection have a predilection for the nerve tissue, and tend to cause tabes and general paralysis. In dogs infected with trypanosomiasis, Spielmeyer found cord lesions—early degeneration of the posterior roots, of the sensory root of the fifth nerve, and of the optic nerve—suggestive of tabes. These observations gain in interest in the light of Schaudinn's discovery. Schaudinn recognised transitional forms between the spirochæte and trypanosomes in the case of a trypanosome found in the blood of the owl.

The theory that the causal agent of syphilis and trypanosomiasis are allied forms, derives support from the clinical and pathological resemblances between the two maladies they produce.

Congenital Defects of Cranial Motor Nerves.—So little is known as to the exact nature of the lesion in this malady, which was originally described by Möbius under the name of *kern-* or *muskelschwund*, that Neurath's paper (*München. med. Wchnschr.*, 1907, June 19) is welcome as adding one to the very few autopsy reports which exist. The disease generally occurs as congenital facial palsy, and there is often also paralysis of one or more eye muscles, or of the tongue. The condition is stationary, not progressive; electrical response is totally abolished, and there is no reaction of degeneration; contractures and fibrillary twitchings do not occur. Occasionally deformity of the outer and middle ear is associated with facial paralysis. Möbius thought that the condition was due to a toxic degeneration of the cranial nerve nuclei, but offered no post-mortem evidence. Later observers (Kunn and Heubner) regarded it as a primary aplasia of the nerve cells, not a degeneration. Marfan and Delille examined a case in which there was an abnormality of the ear, and concluded that the primary lesion was in the facial trunk (from pressure of the mal-developed bone) with secondary atrophy of the nucleus. A third post-mortem, made by Rainy and Fowler, showed appearances strongly supporting Möbius's contention, that the process is a degeneration, not an aplasia. Neurath's case, the fourth examined after death, was that of an infant æt. 6 weeks, with complete right-sided facial paralysis including the palate, and nystagmus. There was a whole series of other congenital malformations—deformity of the ear, patent ductus, coloboma of the choroid, undescended testicles, and aplasia of one kidney. Unfortunately, the peripheral nerves and muscles escaped examination, but the most thorough examination of the brain and cord failed to show any difference on the two sides, or, indeed, any deviation from the normal. The case therefore differs from the three previously reported in the fact that the facial nuclei were intact, and Neurath supposes that the condition was primarily a defect of the facial muscles, comparable to congenital absence of the pectoral sternomastoid, etc. It is somewhat curious that in so well marked a class of case as these are clinically, the only four post-mortems should have given such different findings—aplasia, degeneration of nuclei, degeneration of the nerve trunk, and an intact central nervous system.

CERVICAL RIBS.—Only within the past year or two have the nervous symptoms due to cervical ribs received any attention, and quite recently several papers have appeared on the subject. Russell (*Med. Rec.*, N.Y., 1907, February 16) finds only ten records of cases of supernumerary rib causing pressure on the brachial plexus, though a large number have been reported on account of symptoms due to partial or complete occlusion of the subclavian artery. He gives details of five cases under his own care, and these illustrate fairly well the clinical features of the condition. CASE 1.—Female, æt. 27, complaining of prickling sensations in the ulnar side of the right forearm, cramps in the ring and little finger, weakness of the thumb muscles, a coldness of the extremity. These symptoms had begun five years previously, and have steadily increased since that date. The muscles of the forearm and ball of the thumb were wasted, and the movements of the fingers weak; there was anæsthesia over the region supplied by the first dorsal root. Reflexes normal, pupils equal, no trophic changes, right hand cooler than left. Skiagrams showed bilateral cervical ribs. CASE 2.—A brother of the preceding patient, æt. 35; complaint, inability to use the right hand properly. Nine years previously had difficulty in writing and sensation of pins and needles; this was diagnosed and treated as writer's cramp. On examination there was weakness of the movements of the right thumb and flattening of the thenar eminence. Skiagram showed bilateral cervical ribs. CASE 3.—Female, æt. 24, complaining of pain down inner side of right arm, cramps in the fingers, and wasting of thumb muscles. Duration of symptoms, four years. On examination, no anæthesia; atrophy of thenar eminence. The cervical ribs were readily palpable; in the first two cases they could not be felt. Cervical ribs are probably often present without causing symptoms; they are said to be most common on the left side, but the symptoms are generally right-sided. Symptoms are more frequent in women than in men, and generally begin between the nineteenth and thirtieth years. Probably the greater use of the right arm predisposes to its being affected, while the delayed onset is due to the fact that ossification is not completed until the twenty-fifth year. In Russell's Case 4, there was vascular as well as nervous symptoms; the patient was æt. 31, and had suffered for nine years from attacks of cyanosis and pallor of the right hand. On examination, a mass was felt in each supraclavicular fossa, and over this the artery coursed. There was gangrene of the tips of the fingers.

Gardner furnishes a general review of the subject (*Gaz. des hôp.*, Paris, 1907, May 25 and June 1). It is due to radiography that a malformation which used to be looked on as merely a curiosity has been shown to merit the attention of neurologists.

1. *Anatomy.*—Cervical ribs are reversions to a primitive type; apparently they are sometimes hereditary. The deformity consists in an abnor-

mal development of the anterior tubercle of the transverse process of the seventh cervical vertebra, much less commonly of the fifth and sixth. In most cases the malformation is bilateral, though on one side the rib may be so small as only to be seen in a skiagram. In spite of the bilateral lesion, symptoms are almost invariably one-sided. Like most deformities, cervical ribs are often accompanied by other vices of development; congenital scoliosis occurs with comparative frequency. Females preponderate among the sufferers—a fact which has been known since the seventeenth century, for in 1650 it gave rise to an animated discussion based on the biblical story of the creation of Eve. Gruber divides cervical ribs into four categories—(1) Elongation of the apophysis, not reaching beyond the end of the transverse process; (2) simple elongation, beyond the lip of the transverse process; (3) longer ribs, fusing by their extremities with the first dorsal rib; (4) complete ribs, articulating with the sternum. The minor degrees of the deformity are the most common.

2. *Relations.*—The subclavian artery and brachial plexus run in front of the rib if it is short—less than 5 cms. The normal position of the vein being below, and in front of, the artery, its relations are less disturbed, and pressure on it is rare. When the rib is longer, the artery and plexus pass over it, hence the lowest cord of the plexus is most liable to suffer.

3. *Symptoms.*—These are summarised in the word *pressure*, either on the artery, brachial plexus, or, more rarely, vein. Symptoms, however, occur in only from 5 to 10 per cent. of all cases. The reason for this immunity is the small size of many supernumerary ribs, and compensatory growth of artery and nerves in many cases. The evolution of symptoms depends on the growth and rigidity of the ribs. The period of greatest growth is from the fifteenth to the twenty-fifth year, and at this time, also, the ribs become more rigid. In most cases symptoms do not occur until after the fifteenth year, and sometimes they are delayed until the fortieth. This very late development probably depends on lessening elasticity of the vessels as age advances. Trauma sometimes determines the onset of symptoms. In two-thirds of the patients signs of pressure on the brachial plexus occur. Radiating neuralgic lightning pains, increased by exercise or movement, dulling of sensibility or even complete anæsthesia, various paræsthesiæ, chiefly over the domain of the lowest trunk of the plexus; muscular atrophy, especially of the thenar and hypothenar eminences, but sometimes more widely spread, are the predominant nervous symptoms. Compression of the vessels leads to abolition of the pulse, ischæmia, thrombosis, and sometimes gangrene; œdema is rare. Some associated symptoms have been noted; apparently the cervical sympathetic may be compressed, and in some cases inequality of the pupils and palpebral fissures and disturbances of sweating have been noticed.

4. *Diagnosis.*—Unless the rib is so large as to be palpable, a diagnosis can only be made by the X-rays. If this examination is omitted, the condition is liable to be confused with Raynaud's disease or muscular atrophy. The possibility of cervical rib ought to be thought of in writer's cramp, and in cervico-dorsal scoliosis in a young child, and in cases showing vague signs suggestive of subclavian aneurysm.

5. *Treatment.*—The chief practical point is, after a diagnosis has

been made, to investigate carefully whether there are any signs of cord lesion, as syringomyelia has been present in several instances, and to operate on such cases leads to disappointment. The result of removal of the rib is very satisfactory, even marked muscular atrophy being recovered from.

Keen (*Am. Journ. Med. Sc.*, Phila., 1907, February) writes on cervical ribs mainly from the surgical standpoint. The diagnosis cannot be made with certainty without X-rays. When the cervical sympathetic is affected, there is some presumption that the patient also suffers from syringomyelia. Hoarseness is not uncommon; its cause is uncertain, but one patient certainly suffered from paralysis of a vocal cord from syringomyelia, as well as cervical rib. Aneurysmal dilatation of the subclavian artery is common; curiously, however, the dilatation is usually distal to the rib. Congenital scoliosis is due, usually, to the intercalation of a supernumerary vertebra to which the rib is attached; hence the convexity is towards the rib. Surgical treatment should not be too hastily undertaken. The indications are severe pain, muscular wasting, or impending gangrene.

SURGERY.

UNDER THE CHARGE OF

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THE SURGERY OF GASTRIC AND DUODENAL ULCERS.

IN a valuable and suggestive paper, William J. Mayo (*Ann. Surg.*, Phila., 1907, June) draws attention to certain contributions made by surgery to a better understanding of gastric and duodenal ulcers. Ulcers of the stomach, he points out, may be divided surgically into two classes—(1) The indurated or callous ulcer; and (2) the non-indurated or mucous ulcer, in which the site of the ulcer does not betray its presence by thickening or other sign, and is usually located only with the greatest difficulty. Nearly all the failures of surgery are found in this second group; because the existence of the ulcer is often extremely doubtful, the condition is apt to be confused with pyloric spasm, and the ulcer does not give rise to the mechanical interference with the progress of food.

In 200 cases operated upon by the Mayos, eighty-seven involved the stomach, ninety-eight the duodenum, and fifteen were independent ulcers of each viscus, thus demonstrating that ulcers which can be recognised are as often found in the duodenum as in the stomach. This discrepancy from the older statistics is explained by the fact that the canal of Jonnesco—the terminal three-quarters of an inch of the pyloric end—does not take part in grinding functions, and is to be considered with the pyloric apparatus. Ulceration of this canal is uncommon, the large majority of ulcers involving the lesser curvature above the pylorus. The typical duodenal ulcer is to be found in the upper inch and a half of the duodenum, and in 96 per cent. of cases extends to within three-quarters of an inch of the pyloric sphincter. This fact has led to the belief that the ulcer was pyloric, and therefore gastric, and the statistics have been compiled on this mistaken idea. In an ulcer with parts fixed by adhesions it is often difficult to identify its location. The best way to do this is by noting the arrangement of the blood vessels. A thick-walled vein is to be found extending from the inferior margin of the pylorus on the gastric side upward and across about three-fourths of its extent. From the superior margin a similar vein extends downwards until it nearly meets the one from below.

In 54 per cent. of cases of cancer of stomach submitted to resection, the clinical histories and pathological examination made it certain that the cancer had its origin in an ulcer. In 80 per cent. of the cases the cancer had its origin in the pyloric end of the stomach. The topography of ulcer and cancer were found to be the same. The author has only seen three cases of primary cancer of the duodenum. Cancer of the duodenum is thus rare. In five cases a cancer of the stomach was found developing upon the margin of a duodenal ulcer which had extended up to and invaded the pylorus, showing the susceptibility of the stomach to carcinoma as contrasted with the duodenum.

Regarding the second class, or non-indurated ulcers, in which the lesion is not demonstrated and the evidence is based on defective clinical examinations, the lesion is supposed to be mucous, and not to involve those external gastric and duodenal envelopes which lead to identification. That an acute non-indurated ulcer does exist, the author does not doubt, but as to the presence of a chronic non-indurated ulcer, facts have not yet been clearly collected. In contrasting the two groups, the chronic indurated ulcer produces certain phenomena. In it partial healing may take place, but the cicatricial tissue soon causes symptoms indicative of obstruction. Evidences of blood are helpful in diagnosis. Chronic non-indurated ulcer, on the other hand, if it exists, is indefinite in its symptomatology. Of misleading symptoms pyloric spasm is the most mysterious, and in the author's experience is not regularly seen in indurated ulcer, but is a habitual accompaniment of other morbid conditions, especially as an indication of an irritation in some part of the intestinal canal which causes an irregular attempt to close the pylorus and thus prevent food entering the disturbed area.

At the present time the author does not consider a diagnosis of mucous or other undemonstrated ulcer indicates a surgical operation, unless there exists a complication such as perforation, hæmorrhage, or obstruction.

THE MODIFICATION OF MALIGNANT TUMOURS BY THE INJECTION OF ANIMAL'S BLOOD.

PROFESSOR BIER (*Deutsche med. Wchnschr.*, 1907, No. 29) records some of the results which he has found to follow the injection of lamb's or swine's blood into the human subject. His observations are not yet complete, but are published at present to afford a comparison with the results which have been claimed to follow the injection of ferments in cases of malignant disease in the human subject. He has found that the injection of blood from another species into man produces fever when the blood is introduced intravenously, and a local inflammatory reaction when it is introduced directly into the tissues. The amount of febrile or inflammatory reaction can be controlled by regulating the dose injected, as well as by using different varieties of blood, lamb's blood, for example, producing less marked changes than swine's blood. The injections never, he says, cause serious or lasting lesions, and form the safest means of producing temporary fever or local inflammation. He has for the present given up intravenous injection, and makes use only of injection into the tissues directly. In his present short communication he deals only with the effect of these injections on malignant tumours, though the subject has probably wider applications. He relates two cases to show that such injections have a very marked, though not curative, effect on inoperable malignant growths. In one a marked local reaction followed the injection of swine's blood into the neighbourhood of an epithelioma of the cheek and surrounding parts, with the result that the growth of the tumour was temporarily checked, and its substance partly destroyed by the inflammation, as shown by microscopic examination of parts removed. In another case, of a large tumour growing from the thyroid gland and filling up one side of the neck, an almost complete necrosis of the main mass of the tumour followed the injections. Bier does not in the meantime anticipate that a method of curing malignant tumours will be found by developing the method he has used, and states specifically that nothing like genuine cure has been shown to result from the injections. His results, however, open up lines for inquiry, and are of great interest when compared with those which have in some cases followed injections of other substances. He does not recommend this treatment for general use till further observations and experiments have been done to determine accurately the possibilities attending its use.

THE TREATMENT OF MASTITIS BY BIER'S CONGESTION.

ZACHARIAS (*München. med. Wchnschr.*, 1907, No. 15) writes enthusiastically of the value of Bier's method in treating cases of puerperal mastitis. In comparing the results of the former "antiphlogistic" treatment with those of the congestion treatment, he found that ten of his last thirty cases treated by the older methods went on to abscess formation and required operation, while only two out of thirty-three cases treated by Bier's method came to operation.

The method employed is to apply a suction-glass surrounding the whole breast, and exhaust the air in it by the usual aspiration pump till the breast takes on a blue-red colour and the surface veins are visibly distended. The air must be exhausted slowly, no pain must be caused. The applications are made twice or three times a day for half an hour at a time, and during each application the glass should be removed and reapplied once or twice. When the painful infiltration of the breast subsides and the temperature falls, the treatment is stopped. If this treatment is begun early, resolution will likely follow. In cases which are not seen till pus has formed, a small incision should be made and the glass applied as before. In some cases an inflatable rubber collar round the rim of the glass is of advantage in adapting the glass accurately to the chest wall round the breast.

PARALYTIC DISLOCATION OF THE HIP, ITS ORIGIN AND TREATMENT.

BÖCKER (*Deutsche med. Wchnschr.*, 1907, No. 29), as the result of a careful study of four cases under his own care, and of those recorded by others, formulates the following conclusions:—(1) Acute poliomyelitis, with resulting paralysis, in children can lead to paralytic dislocation of the hip. (2) The origin of the dislocation is well explained by Seeligmüller's "antagonistic-mechanical" theory. (3) Anterior or posterior dislocation results when the muscular balance is disturbed, *i.e.* when one muscular group remains sound and another is weakened or paralysed. (4) Posterior dislocations are commoner than is usually supposed (seventeen anterior and nine posterior dislocations are now on record). (5) Anterior dislocations are not easily recognised on account of the marked adductor contracture and the presence of the femoral head below the horizontal ramus of the pubis. (6) An X-ray photograph can be relied on to decide between complete and partial dislocation. (7) Prophylactic measures, after an attack of poliomyelitis, are of the greatest importance in avoiding contractures with resulting dislocation. (8) In cases of complete dislocation, tenotomy followed by manipulation should be tried, in early cases. In old-standing cases operation is advisable. (9) In partial dislocation with the formation of a false joint, manipulation and orthopædic treatment, or open incision with division of muscles and fixation in adduction and extension, should be carried out.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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REMOVAL OF THE PLACENTA.

M. HOFMEIER (*Berl. klin. Wchnschr.*, 1905, March 25) discusses the proper management of the third stage of labour. He recommends absolute non-interference and careful watching, with the fundus firmly held. The occurrence of contractions should be waited for so long as there is little loss of blood and the fundus remains hard. As soon, however, as bleeding appears greater than the patient's condition will warrant, interference should begin. The use of the hands internally should be delayed as long as possible. When they must be used, the author recommends sterilised rubber gloves. Hofmeier has treated sixty-seven cases of adherent placenta, with six deaths, which could in none be attributed to lack of aseptic precautions. In some cases the placenta is so firmly adherent that expression is unsuccessful. Its removal then, piecemeal, is necessary, when it is absolutely impossible to be quite certain that small placental fragments are not left behind. When the membranes alone are retained, if the patient can be kept under observation, it is possible to delay interference, as they generally come away with the lochial discharge, even although there may be slight fever and offensive discharge accompanying this removal. Ergot and antiseptic douches may, however, be given to hasten detachment of the membranes.

PYOMETRA AND CANCER OF THE CERVIX.

BEGOUIN (*Gaz. hebd. d. sc. méd. de Bordeaux*, 1907, March) points out the frequency with which this condition is met with in cases of metritis with senile atrophy of the os, and in cancer of the cervix. When operating for the latter condition, pyometra should be suspected if the uterus is much larger than usual, with a history of intermittent attacks of pain and purulent discharge. It is necessary during operation to protect the parts from infection in those cases, as the discharge contains abundant bacteria of various kinds. The diagnosis of this condition is very frequently made, however, during, rather than before, operation.

PYLORIC STENOSIS IN THE NURSING CHILD.

WEYMEERSCH (*Bull. Soc. belge de gynéc. et d'obst.*, Paris, tome xviii. No. 4) refers to this condition, resulting in dilatation of the stomach from a deformity occurring in intra-uterine life. The symptoms are, the appearance, while apparently in good health, of persistent vomiting without bile, and occurring soon after nursing. There is marked peristalsis, but no tumour to be felt, and obstinate constipation is the rule. As to etiology, Weymeersch gives three theories—(1) Simple spasm; (2) muscular hypertrophy from excess of function and stenosis, as the result of contraction of the thickened muscle; (3) true stenosis with hypertrophy, the latter being the primary lesion. The treatment of the last is to reduce the residue of the food so as to lessen the necessity of functional activity, to wash out the stomach, give sedatives, and apply hot compresses over the stomach. Nutritive injections and rectal feeding are also to be used.

FIBROID TUMOUR SUPPURATING AFTER TYPHOID FEVER.

DOLORE and Chalier (*Lyon méd.*, 1907, May) report the following case: —P., æt. 30, had a typical attack of typhoid fever. She was known two years previously to have had a small fibroid tumour causing no symptoms. After her recovery from the typhoid attack, she was readmitted to hospital on account of abdominal pains, fever, and rigors. It was supposed that the patient had a relapse. A pelvic examination, however, showed the presence of a tender mass in the left broad ligament. Supra-vaginal hysterectomy was performed, the ovaries being removed with the uterus. On examination after removal, two fibroids about the size of an orange were found on the anterior and left side of the uterus. The latter had bulged into the left broad ligament, and accounted for the tenderness caused by pelvic examination. On opening this fibroid, it was found to contain a large cavity full of greenish pus. The authors consider that the fever had caused the suppuration, as there were no such signs in the tubes and ovaries which might have caused secondary infection of the uterus.

CLIMACTERIC HÆMORRHAGES SIMULATING CANCER.

MYER-RUEGG (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 22) refers to five cases where atypical hæmorrhages had occurred at the climacteric, giving rise to the suspicion of malignant disease. Careful examination, however, showed no trace of incipient cancer either in the cervix or body of the uterus. The irregular hæmorrhages were caused by acquired cervical hæmatometra, the retained blood escaping from time to time in the form of a brown discharge. The condition would appear to be due to an atrophic narrowing of the os externum, with some contraction at the uterine end of the cervix. Examination with a probe showed the cervix to be converted into a fusiform canal, from which there escaped dark blood in more or less abundance. All hæmorrhage, however, ceased when the cervix was fully dilated; and in none was the cavity of the uterus enlarged. Those cases, however, require to be carefully watched. Schick reports a case where atypical hæmorrhages occurred in a patient æt. 55. The uterus was curretted, and nothing suggestive of malignancy was found in the scrapings. But subsequent examination showed the presence of cancer of the body of the uterus, with metastatic growths in the pelvic connective tissue.

A CASE OF ULCERATION INTO THE INTESTINE BY A TOOTH FROM A DERMOID OVARIAN TUMOUR.

KROPH (*München. med. Wchnschr.*, 1907, No. 18) reports the following unusual case:—P., multipara, æt. 35, was operated on for a dermoid ovarian cyst during early pregnancy. The tumour was so firmly adherent to intestine that the latter was opened into during removal of the tumour. From the part of the cyst adherent to the bowel there was found projecting a tooth-like structure. The cyst was partly dermoid, the remainder of it being multilocular in character. The patient recovered from the operation.

THE MODERN TREATMENT OF PURULENT SALPINGITIS.

ATANASESCU (*München. med. Wchnschr.*, 1907, No. 12, p. 587) states that purulent inflammation of the Fallopian tubes varies according to the type of the lesion, the course of the disease, the causative micro-organism, and the complications. The correct treatment is equally variable. Except when the patient's life is endangered, demanding immediate interference, expectant treatment may be adopted till the acute inflammatory condition abates. Unless the condition becomes worse, medicinal treatment may be continued, such as rest and hot douches, surgical treatment being reserved for cases obviously getting worse. The abdominal route is to be preferred, and only in cases where collections of pus are seated very low down in the pelvis is it safe to operate from the vagina.

INJURIES OF THE CERVICAL VERTEBRÆ OF THE CHILD IN DIFFICULT EXTRACTIONS OF BREECH CASES.

HOFBAUER (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 13) reports on four cases of lesions of the cervical spine after difficult breech cases. The injury generally occurred between the sixth and seventh vertebræ, causing a pre-vertebral or intra-dural hæmatoma. The symptoms produced by those injuries correspond to the proximity of the respiratory centre. The child does not breathe, although the heart's action may not be disturbed for some time. The only treatment is prophylactic. In difficult breech extractions the Veit-Smellie grip should first be tried, the line of traction being directly axial. Any torsion applied to the child's trunk may favour severance of the spinal column. All methods of extraction should be accompanied by simultaneous expression from above.

THERAPEUTICS.

UNDER THE CHARGE OF

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ANILARSINATE OF SODA (ATOXYL) IN SYPHILIS.

THE anilarsinate of soda (atoxyl) has been found of use in cases of sleeping sickness. Recently it has been tried in syphilis. Lassar, in 1902, used it in small doses, but found no success with it in doses of 20 cgrms. every second day. Paul Salmon employed much larger doses, and obtained better results. Since then, Lassar (*Berl. klin. Wchnschr.*, 1907, No. 22) has reported a second series of twenty-five cases in which he has obtained excellent results since he employed the larger dosage recommended by Salmon. Hallopeau had tried this drug in a series of seventy-two cases, and is able to confirm the statements of Lassar and Salmon. He uses a 10 per cent. solution, and injects into the gluteal region thrice weekly a dose corresponding to 50–75 cgrms. The number of injections given varies between five and nine. Cases were selected which had either had no previous mercurial treatment, or in which a fresh outbreak had occurred during mercurial treatment. The effect of the treatment was very striking, especially in cases of roseola, papular syphilides, and tertiary ulcerations. Exostoses diminish, and pain rapidly ceases. In a case of malignant syphilis, which had proved very refractory to mercury and iodide, the ulcerations were completely cicatrised after a course of six injections of 75 cgrms. of sodium anilarsinite.

Secondary syphilitic ulcerations always proved more rebellious, probably because such cases are usually instances of mixed infection. Still he has seen a number of cases of ulcerating papules on the vulva clear up. A case of squamous syphilides on the palm of the hand proved refractory. Condylomata also are difficult to heal. Further, no success was obtained in leucoplakia of the tongue. It is, however, incontestable that the injections exert a powerful influence upon syphilitic manifestations, and it is probable that the disease could be completely eradicated if one could carry on the treatment for a sufficient length of time. Unfortunately the drug is a poisonous substance, and may give rise to very serious symptoms. Although usually benign in character, these may sometimes prove very alarming. The usual symptoms are colic, nausea, and vomiting. As a rule, these symptoms do not give rise to any anxiety and pass off in a few hours with the use of small doses of opium, but occasionally they become very severe, and may become actually dangerous if the use of the drug is continued. To minimise the risk of such toxic symptoms, attention must be paid to a number of circumstances. The drug does not keep well, and in the course of fifteen days or so splits up into products of greater toxicity. As the same thing happens if a solution of the drug is boiled for any length of time, the ordinary method of sterilising the solutions by boiling them is not available. Hallopean has obtained the drug from two sources, one a German firm and the other from France, and he is inclined to think that the French preparation is less likely to induce poisonous symptoms, though no difference can be detected in their therapeutic activity. The bodily habit of the patient is of importance. He thinks that in women of slender build the dose should be diminished.

Care should be exercised in treating old people and those not in good general health, or the subjects of organic tendency or heart disease. It is highly imprudent to prolong the course of injection to excess, as the drug accumulates in the system. As a rule, the symptoms of intolerance only come on after five or eight injections have been given. It is very probable that the drug decomposes into toxic products. In no other way can one explain the sudden onset of toxic products without any premonitory symptoms. The rapidity and thoroughness with which this dissociation takes place explains the difference between the tolerance which different people show to the drug. The drug is rapidly excreted, and at the end of a fortnight no trace is found in the urine, so that Salmon states that after this interval it is safe to begin a fresh course of injections. Just how long this treatment of interrupted courses can be kept up without setting up a chronic arsenical poisoning is not known. It is probable that in producing the toxic symptoms the chief part is played not by the aniline, but by the arsenic. As regards the use of the drug, Hallopean thinks that now that the effect of the new drug has been thoroughly established, in the treatment of a case it should be associated with a thorough treatment with mercury and iodides. He recommends the following plan: For a patient of average health two injections of 75 cgrms. should be given at two days' interval; these should be followed by four injections, each of 50 cgrms., at intervals of three days. Taking into consideration the fact that the drug accumulates in the system, probably this dosage will maintain sufficient quantities of the drug to act upon the virus of the disease. If, during the treatment, any signs of intoxication develop, such as gastric or abdominal pain, general malaise, or a feeling of weight in the limbs, the injections should be stopped immediately, and not recommenced till all these symptoms have passed off. The general treatment may be associated with local application, either injections or applications of the drug to local manifestations of the disease, *i.e.* gummata, chancres, etc. It is necessary to use more than one series of injections, which may be begun at intervals of fifteen days under careful control of the urine.—*Bull. Acad. de méd.*, Paris, 1907, June 4.

ACUTE PARAPLEGIA AFTER X-RAY TREATMENT OF TUMOUR MASSES.

MARTINI reports two cases in which this uncommon sequela was noted. In both cases the X-ray treatment was followed by rapid disappearance of the tumour masses. In one of the cases a rather severe dermatitis was induced. This was followed by paraplegic symptoms, which caused death within a month. Post-mortem examination showed an extensive myelitis in the lower dorsal and lumbar regions. As the spinal cord was well protected from the direct action of the rays, it is probable that the myelitis depended upon the absorption of toxins formed from the rapid destruction of tumour tissue. Negro has reported a similar case in which a lympho-sarcomatous growth on the neck disappeared rapidly under X-ray treatment within six weeks. Shortly thereafter a myelitis ensued, which proved fatal in ten days.—*Centralbl. f. d. ges. Therap.*, Wien, 1907, July.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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THE VALUE OF THE OPSONIC INDEX IN GLYCOSURIA, TUBERCLE, AND PYOGENIC DISEASES.

DA COSTA (*Am. Journ. Med. Sc.*, Phila., 1907, July, p. 57) communicates a useful paper on his findings in twenty-two cases of glycosuria, and discusses the clinical utility of the opsonin test in other diseases. *Staphylococcus aureus* was chosen as the bacterium with which to determine opsonin values in all the glycosuric cases, since it is to infections [illegible] source that the diabetic appears to be chiefly vulnerable. The results gave low opsonic indices in all cases, and if this be true generally, it explains the feeble resistance which diabetics show to staphylococcal infections, and the prevalence in these patients of boils, carbuncles, abscesses, and similar lesions. He intends later to investigate the opsonic activity of diabetic blood to tubercle, the streptococcus, and other germs. The second part of his paper discusses the opsonic technique, under the following headings:—(1) Collecting the blood and separating the serum; (2) preparing the bacterial emulsion; (3) obtaining the washed leucocytes; (4) measuring, mixing, and incubating the units; (5) preparing and examining the stained films; and has for its aim the overcoming of certain errors and technical difficulties in carrying out the test. The opsonin test may be said to have two distinct clinical values—(1) diagnostic, (2) therapeutic. In diabetes there is no necessity for its use with the former object, but for the latter it gives a clear idea of the patient's resisting power to secondary infection. In early tubercle it has a diagnostic value, for if it be very low it suggests a susceptibility to the disease, and if it be very high, *e.g.* 0·6 to 1·3, it suggests an actual infection, against which the patient's defensive powers are being raised, and thus be a significant corroboration in suspicious but obscure cases. Further, when a normal person is infected with tuberculin R., his opsonic index falls moderately for about two days, after which it rises somewhat above the normal, and finally returns to its original figure. In a tuberculous subject a similar injection is followed by a more decided drop, which continues for a week or so, and does not regain its original height for a fortnight or more. Pleural and peritoneal exudates of a tuberculous origin give a lower index than the patient's blood, and this suggests their nature. But the chief value of the opsonic test is a therapeutic one, namely, its application to the vaccination method of treating bacterial infections. By this method it is possible in many cases to raise low opsonic indices to constant high levels, and thus secure the recovery of the patient. The evidence already available from the treatment of acne, furunculosis, and abscess by staphylococcic vaccine, of malignant endocarditis by streptococcic vaccine, and of tuberculous diseases by tuberculin, gives promise of even more favourable results in the future. It may be useful to mention here the steps necessary for the treatment—(1) Isolation of a pure culture of the bacterium responsible for the infection; (2) estimation of the patient's opsonic index towards the germ thus recovered; and (3) inoculation of the patient with suitable doses of vaccine prepared from this germ, when his index is found to be subnormal.

THE BACILLUS COLI AND BACILLUS TYPHOSUS GROUP IN INFECTIONS OF THE BILE PASSAGES.

F. BLUMENTHAL (*Deutsches Arch. f. klin. Med.*, Leipzig, 1907, No. 88, S. 509) made observations upon the bile of fourteen patients operated upon for cholelithiasis. In ten of them he found bacilli belonging to the great colon group; the other four were sterile. In four of the ten the bacillus was the *Bacillus coli* proper; in one a modified form, which did not ferment sugar, grape sugar, or lactose; in four, the *B. typhosus*; and in one, *B. paratyphosus*, type *a*. He gives a table showing the differential tests (fourteen) he employed. He thinks the presence of *B. coli* is often accidental. In one of his cases he found the *B. typhosus* present in pure culture at the time of operation for removal of a gall stone, and five days later a mixed culture of it and the *B. coli*; while on the eleventh day afterwards the bile was sterile, and the patient recovered. In another case he cultivated the *B. typhosus* from the bile of a patient operated upon for cholecystitis, who had had typhoid fever seven years previously, and found that her serum agglutinated this strain in dilutions as high as 1 : 5000, while it agglutinated ordinary strains of the bacillus only in dilutions of 1 : 50. He thinks that the importance of *B. coli* in the causation of inflammations of the gall bladder has been overstated, and that of the *B. typhosus* underestimated, and discusses the danger to public health arising from persons who may continue for years to pass in the fæces typhoid bacilli coming from the gall bladder.

CAISSON DISEASE—DIVERS' PALSY.

ZOGRAFIDI (*Rev. de Méd.*, Paris, 1907, p. 159) has studied 260 cases among the Greek divers on the African coast. He had the opportunity of investigating the morbid lesions found in seven cases examined post-mortem. He supports the view that increased absorption of air by the blood under increased atmospheric pressure, according to Dalton's law, and its collection in the vessels as gas emboli when decompression is too sudden, is the essential cause of the disease. The gaseous emboli produce foci of softening and necrosis in the brain and cord. The seven typical cases which came to post-mortem died between the fifth and sixtieth day of illness. In all cases the lesions were more or less diffuse, though the dorsal segments of the cord were generally the most affected. In the earliest stages there was intense congestion of the vessels of the cord and its meninges, perivascular leucocyte infiltration, slight proliferation of the neuroglia nuclei, and frequently small hæmorrhages. Cavities and fissures filled with gas were also present, and gas bubbles were found in the vessels of the brain and cord as late as the thirty-sixth day. In cases of longer duration, there were patches of softening of irregular distribution corresponding to the occluded vessels, and leucocyte invasion was present both in the lumen and sheath of these vessels. Some neuroglia new formation had occurred in the margins of the older patches.

STREPTOCOCCIC ERYTHEMA AND ITS RELATION TO SCARLET FEVER.

GABRITCHEWSKY (*Berl. klin. Wchnschr.*, 1907, May 6, S. 556) continues his investigations on the nature of streptococcic erythema. He formerly recommended that children should be vaccinated against scarlet fever with heated cultures of the streptococcus. The object of his present paper is to prove that a streptococcus is the specific cause of scarlet fever. From a careful study of the erythemas which have followed injection with streptococcic vaccine, he thinks this exanthem is identical with that of scarlet fever, and is often accompanied by desquamation, sore throat, vomiting, lymphadenitis, albuminuria—in short, all the symptoms common to scarlet fever. The streptococcus is agglutinated by the serum, not only of vaccinated individuals, but also of those who have had true scarlet fever; and in the latter case, when the reaction is negative, it becomes positive after the injection of the vaccine. He obtained this in five children. It is not easy to see how it is an argument in favour of the specificity of the streptococcus for scarlet fever. It seems rather to be against it. He says that the same symptoms do not follow the injection of any other vaccine (cholera, plague, typhoid); but it is well known that erythemas, at least, do follow other vaccines. Further, he did not prove that the so-called scarlatina streptococcus was more frequently or more strongly agglutinated by the serum of vaccinated individuals than was any other strain of streptococcus.

THE QUICK DEMONSTRATION OF TUBERCLE IN THE URINE BY ANIMAL INOCULATION.

BLOCH (*Berl. klin. Wchnschr.*, 1907, April 29, S. 511) has been able to show the presence of tubercle bacilli in the urine in nine to eleven days after injecting the centrifuged deposit into guinea-pigs in cases where no trace of tubercle was present on microscopic examination. This method of examination is well known, but the period intervening between the injection and the examination of the animal allowed by most workers is longer. Bloch says nine to eleven days are sufficient. He emulsifies the centrifuged deposit of the urine in 1 c.c. of physiological salt solution, and injects it into a guinea-pig under the skin in the inguinal region. He then pinces up the skin and subjacent tissue so as to include the inguinal glands between the thumb and forefinger, and rubs it between them with a certain amount of pressure, so as to bruise the lymphatic glands, and render them more susceptible to the tubercle. In nine to eleven days the animals are killed, and the glands on the inguinal side are found to be larger and to contain more tubercle bacilli than those on the other side.

THE VALUE OF EXAMINATION OF THE BLOOD IN TYPHOID FEVER.

MÜLLER and Gräf have examined 197 cases of typhoid fever (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1907, Origin 1, Bd. xliii. S. 856), by means of blood cultures, serum reaction, examination of fæces and urine. If the blood shows the presence of typhoid bacilli, a certain diagnosis of typhoid can be given; if the serum gives a positive reaction in 1 : 50 or 1 : 30, a probable diagnosis can be given, but an uncertain diagnosis only in cases in which the fæces or urine contain the bacilli. They got a certain diagnosis in 70 per cent. of their cases, from bacilli being present in the blood, and a marked agglutination being given. In 10 per cent. the diagnosis was probable, from agglutination in dilutions of 1 : 30 to 1 : 50. Their work was done in the Kiel Hygienic Institute, where the practice is to ask that the fæces and urine of patients should be sent in addition to the blood. In most cases an examination of the latter is made when the blood result is negative.

INFECTION WITH TRYPANOSOMATA IN THE FOOD

YAKIMOFF and Schiller (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1907, Origin 1, Bd. xliii. S. 694) fed animals (mice, guinea-pigs, rabbits, rats, and dogs) with various trypanosomes (Lewisi, Nagana, Surra, El Debab, Dourine, and Gaderas). The virus consisted of the blood and organs of highly infected animals, made up into a fine emulsion with physiological salt solution and filtered through muslin. It was mixed with the food, and in certain cases (rabbits and dogs) introduced by means of a sound directly into the stomach. In certain cases carbonate of soda and opium were first given, to neutralise the gastric juice and diminish peristalsis. The guinea-pig became infected with Nagana, Surra, and Debab, but not with Dourine and Gaderas. The rabbit gave positive results with Nagana and Debab, and once (out of six cases) with Dourine. The dog was infected with Dourine, and rats with Lewisi. On the whole, the authors got fifteen positive results out of thirty-eight cases, a proportion so high as to suggest that this method of infection might be a natural one. It is not stated, however, that precautions were taken to see that the amimals experimented with were naturally free from trypanosome infection.

PHYSIOLOGY.

UNDER THE CHARGE OF

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ALIMENTARY GLYCOSURIA.

IT is well known that glucose appears in the urine when the amount of sugar in the dietary rises above a certain amount; but if the literature on the subject be carefully examined, it becomes evident, from the want of harmony in the results obtained by different investigators, that there must be many factors concerned in the genesis of this form of glycosuria. Thus Worm-Müller found that the limit of tolerance for glucose varied in the same person from 50 to 100 grms. and even higher, while Moritz placed it much higher, namely, 200 grms., and Hofmeister stated that in many cases it did not occur until about 300 grms. were taken.

In the case of levulose, the limit was found by de Rossi to be 1·9 grm. per kilo., or about 140 grms. for a man of 75 kilos. Most of the work on this sugar has, however, been carried out with mixtures containing glucose as well as levulose, as, for example, honey. Some hold that levulose produces glycosuria more readily than glucose, that is to say, with smaller quantities of the sugar, while others hold that the organism is more tolerant of levulose than glucose. There are still greater discrepancies in the results obtained on feeding with cane sugar. Thus Worm-Müller, Johannson, Brocard give the limit of tolerance as 50 to 75 grms., Hofmeister 150 to 200, Linossier and Roque between 50 and 350 grms. Most investigators hold that the limit for milk sugar is 100 grms. The tolerance for sugars in diseases of the liver and in diabetes has been investigated by very many workers, but in most cases the work has been limited to cane sugar, glucose, and levulose. Even the tolerance noticed by Külz, exhibited by the diabetic for levulose, has been denied by others. There is a diabetic condition where levulose occurs in excess in the blood and only levulose in the urine; and in this case, as a rule, starch and glucose do not affect the levulosuria.

De Filippi of Rome (*Ztschr. f. Biol.*, München, Bd. xlix. S. 511) has investigated carefully the subject of alimentary glycosuria in normal dogs, and those with the liver excluded from the portal circulation by means of the von Eck fistula. He found that any quantity over 9 grms. glucose per kilo. body-weight produced glycosuria, while the limits of tolerance for the other sugars were as follows:—Levulose, 1·5 grm. per kilo. body-weight; cane sugar, about 4 grms.; lactose, 0·8 to 1 grm.

In the case of dogs with the von Eck fistula the limits were as follows:—Glucose, 5·08; levulose, 0·49; saccharose, 0·8; lactose, 0·55. These animals showed no sign of glycosuria until the above-mentioned limits were reached, and they were also capable of making as complete use of starch as normal dogs. In their case it is simply a question of lessened tolerance for the sugars. Whenever other food substances are given with the sugars, the limit of tolerance rises. This is especially evident in the case of lactose in pure solution and milk, a much larger quantity of milk sugar being used up when the latter is taken than with the former.

This influence of other food-stuffs upon the production of glycosuria is probably one of the main reasons for the discrepancies in the results of different workers.

THE INFLUENCE OF VARIATIONS IN THE WATER CONSUMPTION UPON THE ORGANISM.

THIS subject has been much discussed, especially in relation to the treatment of obesity; but the views held by those who have been most occupied with it differ greatly. Thus, at the Fourth Medical Congress in Wiesbaden, Ebstein in the discussion on obesity recommended a diminution in the water intake in the treatment of that condition, while Henneberg insisted upon an increase. Heilner (*Ztschr. f. Biol.*, München, Bd. xlix. S. 373) comes to the conclusion that, in order to obtain an increased combustion of the fat of the tissues, the water must be given to the individual while he is in a condition of hunger. He must also be kept quiet, and with the temperature of his surroundings moderate. To get the best result, the person must not be given food for as long a period as possible after the water has been taken. In the dog a consumption of 2 litres of water on the third day of starvation produces a distinct increase in the excretion of carbonic acid. The proteid and fat decomposition were both estimated by de Filippi, and one example may be quoted to show the extent of the change produced by the intake of water. The water was taken in this case on the fifth day of starvation.

This influence of increased water consumption upon the proteid and fat combustion is not to be observed when the water is given to animals supplied with food. Thus an animal kept in nitrogen and fat equilibrium on a certain diet will remain in the same condition, even when large quantities of water are taken.

Days (no food taken).	Proteid Decomposition.	Fat Decomposition.
	Grms.	Grms.
3	17·98	80·21
4	17·72	86·70
*5	24·92	102·13
6	16·52	93·30
7	17·98	92·33

The effect of water upon the nitrogen output of the starving animal is not due simply to the washing out of preformed nitrogenous decomposition products from the tissues, but is brought about by an actual increased disintegration of the proteins.

Body Temperature and Excitability of the Cardiac Nerves.

Otto Frank (*Ztschr. f. Biol.*, München, Bd. xlix. S. 412) sums up the results of an interesting research briefly as follows:—(1) A fall in the temperature below normal produces a diminution in the accelerating effect produced by stimulation of the cardiac accelerator nerves. This diminution becomes more marked the lower the temperature, but is not abolished even when the temperature is brought down to 18° C. (2) The effect upon the vagus is quite different. The inhibiting action is not influenced even by the lowest body temperatures that could be attained. At least this is true in the case of the dog, but in the case of the rabbit there is a marked diminution in the inhibitory action produced by temperatures below 25° C. Frank observes that this difference in the case of vagus and accelerans is probably due to the fact that these nerves affect different parts of the heart.

DISEASES OF THE EYE.

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Ophthalmoplegia as a Family Disease.

Pasetti and Saloni, two Florentine observers, give the history of a very curious occurrence of ophthalmoplegia exterior in several members of one family. The first patient examined was F. B., a man æt. 72, whose father is said to have suffered in exactly the same way as the patient himself. So far as he was aware, his father's parents presented no anomaly. He himself was one of a family of twelve, of whom only he and three sisters survive. The others for the most part died in childhood, some of them of undoubted tuberculosis. His wife was a healthy woman, who bore him seven children, with no miscarriages. Of the family, three are alive, and all of these have nuclear ophthalmoplegia. In the patient's own history there is little to note. It was when he was about 45 that he first observed a slight degree of bilateral ptosis, which has very gradually but persistently increased: for the last four years or more he had worn an apparatus of his own devising for keeping up the upper eyelid, thus enabling him to see. Ptosis is complete, and the ocular movements so greatly interfered with that they can hardly be said to exist, but the pupil reactions are quite intact; the man is well nourished, healthy and strong for his years.

His sister, E. B., is now 66 years of age. She was married at 20, and has been pregnant nine times (twins twice). Seven of her children are alive and well. She could give no proper account of the onset of her malady, but she has certainly been in the same state for three years, and probably more. Vision is good and the fundus healthy, but ptosis on both sides is practically complete, and the ocular movements are greatly restricted in all directions. When she wishes to open her eyes, she has to throw back her head and lift the upper eyelids with her fingers. Pupillary reactions are quite correct. L. B., another sister, æt. 61, is in a very similar state, and has to employ the same manœuvre to get her eyes open. All her ocular movements are greatly restricted too, but again the pupil reactions are perfect, and she is in good health. A. B. is another sister, æt. 52. She is affected also, but the ptosis is not so great in her case. Ao. B. is the son of F. B. He is now 43, and has noticed ptosis coming on for eight years; pupils and accommodation are quite good, but the ocular movements are slightly diminished in scope. His brother O. B. is æt. 31; he has noticed ptosis coming on for two years now. Pupil and accommodation movements are good, and the ocular mobility is nearly normal. Three other relatives whom the authors did not have the opportunity to examine are known to be affected likewise. According to the authors' conclusions, it seemed probable that the disease showed itself first in the levator of the lid, affecting the ocular muscles proper subsequently; that the lesion is nuclear, and not muscular, can hardly be doubted. The only theory brought forward to explain the strange condition is that there was a congenital deficiency of the neuro-muscular apparatus, by reason of which its activity became worn out and was not restored.—*Ann. di Ottalmol.*, Paris, 1907, April.

CONGENITAL AMBLYOPIA.

It happens every now and then that one meets with the case of an eye to all appearance perfectly normal, without a trace of opacity of any of the media, without any change in the fundus that the most thorough ophthalmoscopic examination can discover, without any error of refraction other than perhaps the most trifling, and yet possessing only very poor vision indeed. This condition we call one of Congenital Amblyopia —a non-committal and colourless diagnosis of a highly unsatisfactory state of affairs. Squint is not infrequently present in such an eye, and if it is, the question is thereby considerably complicated, not made simpler; but squint is often entirely absent. What is the nature of this anomaly? We do not exactly know. It is not so very uncommon; Charpentier in 1866 noted twenty cases of it among 1000 patients, but this seems a strangely high percentage. Polack met with a very typical case recently in a highly cultivated and intelligent patient, a lady of artistic talents, and seized the opportunity thus afforded to study the matter with great care. Two points in particular demanded attention, namely—(*a*) Is the defect confined to the macular region of the retina, or does it involve the rest of that structure? and (*b*) Are other functions of the retina implicated besides the visual acuteness?

The patient regarding whom the investigation was made was 26 years of age, and she neither squinted nor had any record of ever having done so, so that no question of *amblyopia ex anopsiâ* could complicate the case. Vision was $\frac{6}{6}$ in the right eye, but with the left she could only count fingers at 2 M. Her pupil reflexes were good, the fundus showed nothing abnormal, and there was practically no error of refraction. It may be a matter of importance to note that a brother had at one time squinted. The visual acuteness at her macula was found to be forty times feebler in the left eye than in the right, and yet, when the vision of any area of the retina outside 10° from the central point was tested, there was no difference between the one eye and the other. Thus there was a central scotoma in the sense that at the macula the vision was low, but none in the true sense which implies that the macular vision is lower than that of the surrounding retina. On testing the "light-minimum," or the smallest quantity of light perceptible by the eye, no difference whatever was found to exist between the two eyes. The colour perception of each eye was highly developed, as one might expect from the lady's occupation; and it is remarkable, though perhaps not very important, that, if anything, it was a little better, and the fields slightly larger, in the amblyopic eye than in the other. Next the author tested by means of an ingenious apparatus the duration of retinal impressions, and found both eyes exactly alike. In order to produce secondary impressions or after-images, the eyes were fatigued by gazing for a time at a brightly illuminated coloured surface, then a white screen was substituted, and against it the after-images were projected by the patient. These complementary coloured images were absolutely identical for the two eyes. It is thus evident that, in a further sense, there was no central scotoma, since at the centre there was no lowering or degradation of chromatic sensibility. In this congenital amblyopia, then, the sole and only failure appears to be in the accuracy of form-vision.—*Rev. gén. d'opht.*, Paris, tome xxv. p. 12.

GLAUCOMA PRODUCED BY EMOTIONAL EXCITEMENT.

IT has long been an axiom that patients who show liability to glaucoma should be careful to avoid any undue emotional excitement, as this is apt to act prejudicially upon the eyes; for example, if one is about to operate on one eye for glaucoma, it is quite good practice, in order to avoid "accidents," to instil a drop or two of pilocarpin solution into the second eye if it has ever shown any indication of being threatened with the same disease. The anxiety and mental perturbation attendant on the operation seem to be quite enough, in some persons, to precipitate an attack in the second eye. Sonder, writing on this subject, would have us extend this watchfulness against glaucoma, not only to those who have already suffered from the disease, but to all "invalids," and gives some interesting instances from his own practice and from the writings of others of the emotional onset of glaucoma. Thus a patient of his, who had lost one eye from glaucoma, fell from his horse, and at once the other eye was attacked. A strong, healthy girl, æt. 25, was assaulted and beaten by a drunk man, and though the eyes were not injured, glaucoma immediately appeared in both. De Wecker some years ago recorded the case of an old lady who was an inveterate gambler, and who, because she had suffered from glaucoma in one eye, had been forbidden to indulge in her favourite excitement; she disobeyed, lost heavily one night, and her other eye was immediately attacked. A peculiar example is afforded of a patient of Trousseau's, a man who had had prodromal symptoms for a year. When out boating one day he fell overboard, got a severe fright, and when rescued complained at once that he had become blind; subacute glaucoma was found to have actually come on immediately.

There is no doubt that extreme fear, violent anger, or indeed almost any undue emotional excitement, is injurious to some persons in this particular way, and we ought to warn our patients who have shown signs of glaucoma more than we do against any "indulgence" in emotional disturbances. For this reason, as for so many others, it is well even for those who have not shown any signs of disease to cultivate equanimity and to keep a firm hand upon the reins.—*Arch. d'opht.*, Paris, 1906, September.

ANALYTICAL REPORTS.

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PARKE, DAVIS, & CO.'S PREPARATIONS.

Formidine is an active antiseptic product of iodine, formic aldehyde, and salicylic acid, and is intended for internal administration as well as external use. It is insoluble in water, alcohol, and dilute acids, but when it comes in contact with an alkaline medium it slowly dissolves and exerts a germicidal action. It is a brownish powder, with a slight odour, which is non-irritating when applied to the skin. It is more strongly antiseptic than iodoform, and is not liable to produce toxic symptoms. The dose as an internal antiseptic is from 1 to 5 grs., and the drug is supplied either as a tablet or as a dusting powder in sprinkler bottles.

Effervescent Saline Laxative.—Each drachm of this contains 20 grs. of sodium phosphate, 25 grs. of magnesium sulphate, and 10 grs. of sodium sulphate, the nauseous taste of the salt being to a great extent concealed by an effervescent base. Saline laxative is put up in bottles fitted with a metallic screw-top, which serves as a measure. The preparation keeps well, and the form in which it is supplied should make it useful to travellers. The dose is 100 to 200 grs., dissolved in a glass of water.

Improved Cathartic Compound.—These tablets are more active aperients than the older formula, from which they differ only in dose. Each contains colocynth, jalap, podophyllin, leptandrin, gentian, hyoscyamus, and oil of peppermint. They are of the well-known chocolate-coated variety, and are therefore pleasant, as well as active cathartics.

Triple Glycerophosphates with Nuclein.—This new addition to the makers' list of chocolate-coated tablets contains, besides the widely-used glycerophosphates of sodium, iron, and lime, nuclein, a substance introduced into the materia medica about ten years ago on account of its supposed beneficial action on nutrition, and particularly its power of evoking leucocytosis. To increase the leucocytes would appear to be desirable in many diseases, especially those of a chronic infective nature, and it is in such conditions that nuclein has chiefly been used. To combine it with glycerophosphates is reasonable, and the preparation is worth a trial in cachectic conditions. Each tablet contains ½ gr. of nuclein.

Iodalbin is an iodo-proteid compound containing 21·5 per cent. of iodine. Its advantage over the iodides of the alkalies lies in the fact that it is less likely than these to produce iodism. It passes unaltered through the stomach, and is gradually but completely absorbed by the intestine, little being recoverable from the fæces. Clinical observations show that it produces the typical alterative effects of iodides in general, hence it may prove a useful substitute for these when they disagree. The ordinary dose is from 5 to 10 grs.

Nutritive Liquid Peptone consists of beef juice predigested by means of brometone, the proteid digesting ferment of pine-apple juice, and combined with extract of malt. It is thus an easily assimilable food, and may be used to maintain nutrition during acute illness, as well as in wasting diseases and debility. The dose is from $\frac{1}{2}$ to 1 oz.

Nutritive Liquid Peptone with Creosote contains $1\frac{1}{4}$ minim of this drug and 4 grs. of guaiacol in each ounce; it is intended for use as an intestinal antiseptic, and may obviously be employed with advantage in some cases of phthisis and bronchitis.

C. T. Phenol-phthalein Co.—Phenol-phthalein, as is well known, has a purgative action, producing evacuation of the bowels without pain or tenesmus. It is in some repute as a laxative in habitual constipation. These tablets, which are sugar coated, are a convenient form for administering the drug. They contain, in addition to 1 gr. of phenolphthalein, $\frac{1}{500}$ gr. of strychnine hydrochloride, and $\frac{1}{100}$ gr. of extract of belladonna, which act as auxiliaries in giving tone to, and restoring the function of, the intestinal tract. The dose is from 3 to 5.

BAYER CO.'S PREPARATIONS.

Liquid Somatose.—For those who prefer a concentrated food in the liquid rather than in the solid form, the Bayer Co. have introduced a fluid preparation of somatose, the nutritive value of which is very generally admitted. Somatose consists of soluble albumin and salts, and in its liquid form is free from any alcohol or antiseptic. Liquid somatose may be obtained either sweetened or unsweetened, the latter being indicated in diabetes and gastric disturbance. Both preparations are palatable and easily taken; they stimulate appetite and digestion and supply nourishment, and their range of usefulness is therefore large. The dose is a tablespoonful, or more.

Tablet Preparations.—The Bayer Co. have recently marketed 5-gr. tablets of many of their specialities, and have submitted to us as samples trional, veronal, aspirin, heroin, tannigen, and helmitol. The properties of the three first named are too well known to need repetition. Each tablet of heroin contains $\frac{1}{24}$ gr. of the drug, which is perhaps one of the most valuable of newer remedies. Helmitol is a urinary antiseptic built up of citric acid, hexamethylene-tetramine, and formaldehyde; it readily liberates formalin in the bladder in either acid or alkaline urine. Tannigen, the acetic ester of tannic acid, presents the advantage over tannin of passing through the stomach unaltered, and acting on the bowel as an astringent. For such drugs as these the tablet is a convenient form of administration, and the samples submitted to us leave nothing to be desired.

BURROUGHS, WELLCOME, & CO.'S PREPARATIONS.

Argyrol Tabloids.—We have received from the makers samples of tabloid argyrol, a new organic silver compound, which is stated to be strongly antiseptic, and, on account of the fact that it does not coagulate albumin, of marked penetrative power—a matter of importance in treating gonorrhœa, in which the germ is deeply situated in the tissues. Argyrol is used as a solution of from 5 per cent. to 50 per cent., and is supplied in the form of ophthalmic tabloids ($\frac{1}{24}$ gr.) for direct application to the conjunctiva, and in soloids containing either 1 gr. or 5$\frac{3}{4}$ grs. as may be desired.

Phenofax.—This agreeable emollient, which resembles cold cream in odour and appearance, owes its antiseptic properties to the 7 per cent. of phenol it contains. It has a remarkably soothing effect on chaps or cracks of the hands, while from its antiseptic and sedative properties it also lends itself to the treatment of abrasions, burns, parasitic and irritable cutaneous lesions, ulcers of mucous membrane, and other kindred conditions.

Alaxa is an aromatic liqueur of cascara sagrada, in which the drug is combined with stomachics and carminatives. Its flavour is not disagreeable, though bitter, and the claim of the makers that it has a tonic action on the bowel will readily be admitted in the light of what is known of the action of cascara. Alaxa is suitable for the treatment of constipation in pregnancy, on account of the absence of griping and the tonic action aforesaid. Each drm. is equivalent to 24 minims of fluid extract of cascara; the dose is from 1 to 2 drms., as required.

Pectoral Pastilles.—These pastilles have all the good qualities we are accustomed to associate with tabloid products. They are said to contain simple demulcents, sedatives, aromatics, and expectorants, and, where a good cough lozenge is desired, we fancy they will be hard to beat. They are both elegant in appearance and agreeable to taste.

EMOL-KELEET DUSTING POWDER AND SOAP.

(Keltie Products Ltd. Fasset & Johnson, Snow Hill, London.)

WE have for many years known and appreciated the properties of emol-keleet as a dusting powder, which is in every way superior to ordinary fullers' earth. Despite its rather exotic cognomen, it is of indigenous origin—hails, indeed, from Perthshire. It is needless to dwell on the uses to which the dusting powder can be put; suffice it to say that when applied to the skin it has a smooth soapy feel, and a remarkable power of absorbing discharges without rolling into gritty balls as siliceous earths are apt to do. It is an excellent powder for toilet and medicinal purposes.

In emol-keleet soap the incorporation of the powder with a pure superfatty soap neutralises the disadvantages of the excess of unsaponified fat. The soap produces a smooth creamy lather, and leaves the skin soft and velvety. Such soaps as these are far superior to the ordinary variety, and persons whose skins are sensitive will not readily give up superfatty soaps when once they have experienced their benefits. Emol-keleet soaps ought to become popular; they seem to possess more cleansing power than most superfatty soaps; they lather freely in cold water, and they are moderate in price.

CYLLIN SYRUP.

(Jeyes' Sanitary Compounds Co., London.)

In cyllin syrup the makers have produced a modification of their well-known disinfectant which is adapted for oral administration. The cyllin preparations are all standardised as regards their bactericidal power, and their efficiency is stated in terms of carbolic acid. This syrup, of which a sample has been forwarded to us, has a carbolic coefficient of ·3 for B. *dysenteriæ*. It thus has claims to be looked on as an active intestinal antiseptic, and should prove useful in fermentative conditions of the stomach and bowel. The drug has a not unpleasant odour and taste; its dose is from 5 to 10 minims.

BORO-THYMOL.

(Liq. Boro-Thymol Comp.)

Thomas Stephenson, 137 George Street, Edinburgh.

BORO-THYMOL is a clear liquid of an agreeable odour. Analysis shows it to be composed of boric and benzoic acids, alcohol, and the volatile substances thymol, menthol, eucalyptol, and oil of winter-green. It mixes readily with water, is non-toxic, and does not irritate even the most delicate mucous membrane. These properties render it eminently suitable for use as a gargle, nasal douche, mouth wash, dentifrice, etc. It may also be given internally to check gastric and intestinal fermentation. We have pleasure in commending it, not only because of its excellent properties, but also because its composition is not kept secret, the formula being published on the circular accompanying each bottle.

"GLASEPTIC" NEBULISERS AND SPRAYS.

(Parke, Davis, & Co.)

WE have received from the manufacturers samples of their recently introduced "glaseptic" nebulisers and sprays. The nebuliser is designed especially for spraying oily fluids; the spray for use with watery or alcoholic solutions. The two appliances differ slightly in construction, and though each is specially designed for the one class of fluid, it may be used for the other. The essential feature of these, as opposed to most other atomisers, is that they are made entirely of glass, and can thus be thoroughly cleaned. Users of the ordinary type of metal and glass spray must often have been struck with the way in which dirt accumulates about them after a time, particularly when they are not in use, and in this respect the "glaseptic" form seems to us preferable to any other we have seen. They are, besides, effective in giving a finely divided spray. Their size is small, their price moderate, and we predict that they have only to be known to become extremely popular.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Teaching of Clinical Surgery in the Royal Infirmary.

ONE of the great difficulties with which the Edinburgh school has always had to contend is the provision of sufficient clinical material for the large number of students. The managers of the Royal Infirmary have in the most loyal and public-spirited manner assisted the University and the Royal Colleges to maintain the position of Edinburgh as the greatest medical educational centre in the country, but although the Royal Infirmary is the largest hospital in Great Britain, careful organisation is required to make the most of the material available for clinical teaching. It is a truism to state that the welfare and future success of any school depends very largely on its ability to supply students with efficient practical instruction in the three great branches upon which successful professional practice rests—medicine, surgery, and midwifery.

So far as medicine is concerned, the task is a comparatively easy one, and we believe that the pre-eminent position occupied by Edinburgh in the teaching of clinical medicine has never been questioned.

It is different in the case of clinical surgery, and we have heard from more than one source that there is something approaching dissatisfaction with the practical tuition which students attending this school have been able to obtain. The difficulties are far greater than in clinical medicine. A great many of the cases are of an urgent character, and are necessarily dealt with at other times than during the hours that students attend the hospital. Many cases, again, are of such a character that they cannot be used for teaching purposes at all, while, as regards the commoner types of injury and disease, which can be usefully employed for clinical teaching, only a limited number of students can be permitted to profit from the individual examination of the patient. There can be no doubt, therefore, of the necessity of taking every means to utilise the available clinical material to the best advantage, and how to do this has been the subject of the most careful consideration on the part of those in charge of the Medical School. The University Court has now come forward with a definite scheme for the improvement of the teaching of clinical surgery. At present the students are unequally distributed amongst the various surgeons who are qualified to give instruction, a circumstance which is due, in part at any rate, to the fact that the choice of a teacher by the students is largely influenced by his holding an examinership in the subject. We do not mean to suggest that other and better reasons do not weigh with them, but the result has been hitherto that one teacher has more students than he can, under the most favourable circumstances, either accommodate or teach, while the class of another may be well within his capacity in these two particulars.

To meet this difficulty, the University Court recommends that all the ordinary surgeons in charge of wards, excepting only the surgeon teaching women students, should be invited to become University lecturers in clinical surgery under the following conditions: That each lecturer be required to act as an examiner in clinical surgery under the same conditions as the professor; that 75 per cent. of the fees be paid to the lecturer, as in the case of other lectureships; that the University Court provide a sum to each lecturer which will cover the salary of a clinical tutor, while the fees of any extra-mural students would, of course, go directly to the lecturer.

If the above invitation is accepted by the ordinary surgeons, as we trust it will be, two great advantages may be expected to follow—a more equal distribution of the students throughout the different wards of the Infirmary, more individual practical instruction in the form of bedside teaching, and widening of the scope and basis of the examinations, together with a curtailment of the time over which in the past they have extended.

We do not doubt that objections may be urged against the scheme by individual surgeons, but we trust that it will be considered not in a narrow spirit of self-interest, but on the broader ground of the efficiency and welfare of the school, with which the reputation and success of the University, as well as the extra-mural school and of every individual teacher, is closely bound up.

Ethnology and Mental Disease.

RACIAL pathology—the proclivity of different races to various diseases—is an almost unexplored field. It is true that a great deal is known, though much more remains to be learned, concerning the allied problem of geographical pathology, but when we approach the question in its restricted ethnological sense, the majority of us would be hard put to it to do more than mention the susceptibility of the Jewish people to certain nervous and constitutional disorders. It is notorious that some diseases, such as diabetes, prevail unduly among Hebrews; there are even maladies which are peculiar to them, and from which the Gentile is exempt. Jews, from their universal distribution, have afforded a unique opportunity for the comparison of an alien stock with other peoples, and we find that in a sense they have a pathology of their own. May it not be so with other races, only the facilities for comparison being lacking? In the Morison lectures some years ago, Dr. Macpherson reared a part of his argument on the distribution of nervous and mental disease among rude and savage peoples; a more specialised study of race in relation to neuroses has been made by a Hungarian, Dr. Révész.[1]

The races of Asia, for reasons which are not apparent, seem of all peoples most liable to mental disorder. In Japan, neurasthenia and hysteria are rife, especially among the student class. It is difficult to resist the suggestion that the spare diet and strenuous industry of the inhabitants of the island Empire are to blame for this liability. The Japanese, also, are extremely suggestible. This naturally connects itself with the neurasthenic diathesis, and it may well be questioned whether Buddhism, the religion of the less educated Japanese, does not favour it by the attention to theosophical problems it encourages, and its neglect of all objective criticism of nature. In parts of the Japanese Archipelago a psychosis is not uncommon, sufferers from which believe they are possessed by a dog or beaver, and adopt the mode of progression and method of eating of these animals. The malady is more prevalent among children than adults, and is met with particularly during convalescence from enfeebling diseases like typhoid. The psychosis probably arises from the suggestibility of the natives influenced by current folklore of the vampire-legend type. The natives of Annam are also very suggestible, and hysteria is an everyday occurrence. A class of professional hypnotisers exists, who produce hypnosis by waving red banners before the subject's eyes, and at the same time uttering a droning monotone. By reason of their extraordinary suggestibility, the Annamites are apt converts to Christianity—and as ready backsliders.

The neuroses of the Malays are fairly well known. Latah, with its involuntary imitative words and gestures, is very common in Java and Sumatra; it is often hereditary, but is not associated with neurasthenia or hysteria. Latah patients are usually women; nearly all are aborigines, though cases have been observed in Eurasians and Orientals of foreign stock. The indigenes look on the malady as a trifle; it is so common that several cases may be met with in a forenoon stroll. Imitation seems the chief factor in its production. "Running amuck" is a well-known psychosis peculiar to the Malayan tribes. The characteristic phenomena are too well known to need repetition. It is limited to the male sex, and amok patients are said to be recruited almost entirely from Madura and Celebes. After the dramatic stage of the seizure the sufferer becomes stuporose, and on recovery recollects nothing but that he "has seen red," or been haunted by evil beasts. Opium-smoking is not a cause of amok. It has been regarded as a species of intoxication, and as an epileptic equivalent; the latter, however, is denied by many, who will not admit that is is a true psychosis at all, but hold that it is simply an evidence of the normal instability of the Malay brain and the lack of self-control this childish race displays—a moral rather than a mental weakness.

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[1] "Rassen und Geisteskrankheiten," *Arch. f. Anthrop.*, 1907, Bd. vi. Hefte 2 and 3.

In British India, Siam, Burmah, and the neighbourhood of Irkutsk, a malady allied to latah is found; it appears also to prevail among the Lapps, the Ainos of Japan, and some North American Indian tribes. Roughly, it seems a disease of the Mongolian stock. The Parisian malady named after its describer, Gilles de la Tourette, is apparently of the same nature.

Less is known of the nervous diseases indigenous to Africa. The Abyssinian lathyrism follows the use of *Lathyrus sativus cœruleus*; the symptoms resemble spastic paralysis. Lathyrism also occurs in Algeria. Alcoholic excess is, of course, extremely common among savages, but, contrary to what is usually believed, permanent bad effects seem rare. Thus in Algeria the natives drink enormously of spirits and absinthe, yet seldom get drunk. If actual intoxication does occur, it is of short duration, while delirium tremens and alcoholic neuritis are very rare. A similar freedom from the evil effects of alcoholism, despite an overwhelming tendency to excess, has been noted among the negroes of the Zambesi. Among the negro insane, mania preponderates; true epilepsy is almost unknown, and progressive paralysis does not occur.

In North America, owing to the intermingling of races, comparative pathology has been more widely studied. The various forms of mental disorder occur with almost equal frequency among persons of Anglo-Saxon, Teutonic, Celtic, and Semitic stock. General paralysis is commonest among Anglo-Saxons, rarest among negroes, notwithstanding the prevalence of syphilis among them. Melancholia is most frequent among Germans, while there is a greater tendency to terminal dementia among Anglo-Saxons than among Teutons or Celts. Hereditary psychoses are most often met with in Jews. In the State of Maine, particularly, a curious neurosis, known locally as "jumping," is recognised; it seems to resemble latah. The negroes of Brazil share with their brethren of the Zambesi great tolerance of alcohol, with immunity from any permanent ill-effect of their potations.

In Greenland there is a peculiar nervous disease called "Kayak-giddiness." Vertigo and sickness attack the Greenlander when he is alone in his canoe with the sun flashing on the waves around him. It is believed to be a fear neurosis, comparable to agoraphobia. The Greenlander seems to enjoy the usual immunity from disastrous after-effects of alcohol. So pleasant a fellow is he in his cups, Peary states, that the Greenland lady rather delights than otherwise when her lord gets drunk.

Even in Europe we find a certain ethnic tendency to specific nervous disorders. Whole villages of La Vendée are given over to neurasthenia and hysteria, which has been variously ascribed to intermarriage, alcoholism, and religious fanaticism. Belief in possession by reptiles is an extremely common neurosis among the lower strata of Russian peasants.

Functional neuroses among primitive races have a twofold interest. It is often assumed that hysteria and neurasthenia are nineteenth-century maladies — tributes paid to the stress of civilisation. In a sense, of course, this is true enough, for the social *milieu* must play a great part in their production. But the savage is as hysterical as any society girl, as neurasthenic as the Slav. And no wonder that it is so, for his world is peopled by ghosts, all potentially evil, all terrific; natural agencies appeal to his anthropomorphic sense as spirits who will reck him good or ill; dream life and waking hours are confused in his mind in a way of which we can form but small conception. There is not a little to be said for the view that in its grosser forms, at least, hysteria is atavistic. Another point of interest is this. What is the relation of folklore, mythology, such customs as fire-walking, divining, mediumship, witchcraft and others, to functional neuroses? That customs and beliefs on the one hand, and the mental constitution of those who hold and practise them, on the other, must interact and react, is certain, but we must suppose that the latter is the primary element. With culture, mental stability increases; the customs and beliefs persist, and hundreds of generations later the children of La Vendée villagers take an epidemic of hysteria from uncontrollable belief in ghosts—figments of the neurotic imagination of their remote parents. Mythology, according to Max Müller, is a disease of language; it is at least as likely that it and its allies were the inevitable products of the unstable evolving human brain, and that they now react on that more stable and highly evolved organ in the fashion which in a more restricted sphere of pathology is known as a vicious circle.

Typhus Fever and Fleas.

WHILE the etiology of the commoner exanthemata has received very constant and close study during recent years, the same cannot be said in regard to typhus fever. The reason for this is, no doubt, the comparative rarity of epidemics and the small number of cases which now occur, as a result of the preventive measures adopted. In Scotland, where during the first half of last century the disease was endemic, more especially in the larger towns, and caused a mortality which to-day seems almost incredible, typhus fever is practically unknown to students of the present generation. It has not, however, wholly disappeared, and almost every year the statistics of Glasgow, Edinburgh, Leith, Dundee, and Aberdeen show that the disease is still slumbering in our midst, and were it not for the promptness and vigilance of the health authorities might even now be fanned into flame and cause widespread destruction amongst the poorer classes of the population. Typhus fever has rightly been regarded since the early Victorian days as the type of a filth disease, that is to say, one which is fostered by those inseparable companions—poverty, dirt, and overcrowding.

Enormous progress has been made in combating these conditions throughout the country, with the result that the disease has become a negligible quantity in mortality tables, and in many parts of the country has entirely disappeared.

Unfortunately, while the above insanitary conditions have thus been proved to foster the disease, we are still in absolute darkness as to its originating cause, and necessarily therefore in regard to many points in its natural history.

This fact, together with the insidious and deceptive nature of the early symptoms, as well as the unavoidable ignorance of medical men of the present day in regard to its clinical appearances, favour the occurrence of those outbreaks which, as we have already mentioned, still periodically tax the energies and threaten the peace of mind of the health authorities in our larger cities. Such an outbreak occurred last year in Aberdeen, and has been most ably reported upon by Professor Hay, the medical officer of health. The outbreak comprised 131 cases, with twenty-two deaths; and at an early period in its course Dr. Hay began to suspect that the infection of typhus, like that of malarial fever, may be conveyed by insects, and in the present case by body vermin, such as fleas. Unfortunately, it was not found possible to test this suggestion by means of bacteriological and experimental investigation, but he regards certain facts as strongly supporting the theory. In the first place, every case of typhus exhibited flea-bites, and the members of the hospital staff who were attacked by the disease were those who complained most of flea-bites. Needless to say, flea-bites were carefully distinguished from the characteristic rash of typhus fever. However clean and free from vermin certain patients were, they still were found to have been, at the probable time of infection, in contact with vermin-infected patients, and in no case did the vermin spread in families of perfectly clean habits and who were free from vermin. Dr. Hay adduces other evidence in support of his theory, and we must confess that it is one which, in the light of the brilliant researches into the etiology and modes of infection of certain tropical diseases, deserves careful consideration and study.

Future observation may show that fleas do play a part in propagating the disease, and may thereby assist in determining the active infective agent; but from an experience of many outbreaks of typhus fever we confess to a scepticism in support of which much evidence could be adduced.

Even if it be proved subsequently that fleas are innocuous so far as this disease is concerned, a good object will have been served by Dr. Hay's suggestion indicating the possibility of danger from vermin and uncleanliness.

Dr. R. M. Buchanan has recently published the results of a most interesting investigation into the carriage of infection by house flies, in which he clearly proves the great danger to which we are being constantly exposed from contamination of our food through this source.

The public do not sufficiently realise that both fleas on the person, as well as numerous flies in a house, are the result of dirty habits, and that their presence may not be unattended with grave results to health.

The French Congress of Surgery.

THE Association française de Chirurgie was founded in 1884, and was recognised by the French Government "comme établissement d'utilité publique" in a decree signed by President Carnot in 1893. It includes among its members the majority of French surgeons, both in Paris and in the provinces, and a considerable number of foreigners, among whom there are only two from Great Britain—Reginald Harrison and B. G. A. Moynihan.

We have been furnished with the documents relating to the twentieth Congress of the Association, which is to be held in Paris from the 7th to the 12th October under the presidency of Professor Paul Berger. There are three subjects for which special discussions have been arranged—"The Influence of the Röntgen Rays on Malignant Tumours," "The Transplantation of Nerves, Muscles, and Tendons in the Treatment of Paralysis" (Mr. Robert Jones of Liverpool has been invited to take part in this), and the "Chronic Surgical Affections—Tuberculosis and Cancer—in their relation to the Accidents of Occupation." The programme of the Congress is a very full one, providing work for the entire afternoon on six consecutive days. An exhibition of surgical instruments will form an interesting and important part of the meeting.

The Post-Graduate Vacation Course in Medicine, which has just been completed in Edinburgh, has once more justified the most sanguine hopes of those responsible for its organisation, and its success has been due to a large extent to the harmonious arrangements entered into by the University and the Extra-mural School, and the industry and *savoir faire* of the Secretary—Dr. Edwin Bramwell.

The course has been attended by eighty graduates, hailing from all parts of the world, and it is very agreeable to be able to state that they have shown the greatest enthusiasm in their work, and stimulated their teachers to give of their best.

In addition to a large number of private social functions, the members of the course, the teachers, and their friends were entertained at an evening reception by the Royal College of Surgeons, the guests being received by Mr. Joseph Bell, a former president of the College.

Dr. Alexander James and Dr. Charles Watson MacGillivray, having completed their fifteen years of service in charge of wards in the Royal Infirmary, have been placed on the Consulting Staff; Dr. R. W. Philip and Mr. James Hodsdon have been promoted to be Physician and Surgeon respectively.

The resignation by Dr. James Rutherford of the appointment which he has held so long, as superintendent of the Crichton Royal Institution, Dumfries, was not unexpected; for some months the state of his health has been such that no hope could be entertained of his ever being able to resume work. His services in the cause of mental science are well known, and we trust he will be spared to enjoy the leisure which will now be at his disposal.

Universal regret was expressed when it became known in summer that Dr. Murdoch Brown had had to apply for relief from his hospital work; our readers will be gratified to learn that he has convalesced so far as to be able to enjoy his favourite recreation on the lower reaches of the Clyde.

ORIGINAL COMMUNICATIONS.

THE MAKING OF A SHELF BELOW THE UNDULY MOBILE KIDNEY.[1]

By ALEXIS THOMSON, F.R.C.S.Ed., *Surgeon, Deaconess Hospital, and Assistant-Surgeon, Royal Infirmary, Edinburgh.*

THE principle of making a shelf below the unduly mobile kidney, as an alternative to fixing the organ by means of stitches, was introduced some years ago in America, and especially advocated by Harris of Chicago.[2] So far as I have been able to learn, it has received very little attention on this side of the Atlantic, in evidence of which it might be mentioned that Kocher, in the fifth edition of his "Operationslehre," recently published, does not even mention it. I have therefore thought it desirable to bring the subject before the Society.

With regard to the causes of undue renal mobility, it must be confessed that in spite of the enormous amount of observation and thought expended on their elucidation, there are hardly two writers whose views will be found to agree, and I am confident that were I to express decided opinions on the subject to-night, every member of the Society would wish to take part in what would doubtless develop into a heated controversy. If, for example, I were to lay stress upon the influence of pregnancy and parturition in the production of renal mobility, I should be told that the majority of cases occur in nulliparous women, and that some of the most extreme forms of the condition are met with in the male sex. If I were bold enough to suggest that tight lacing was an influential factor in the production of renal displacement, I should probably find the argument advanced that the effects of the corset vary with the level at which the constriction is applied. If the trunk is constricted below the level of the ribs—in the position of the masculine waist, when such a phenomenon exists—the kidney is not only contained securely within its niche, but it will have difficulty in indulging in its normal respiratory movements. If, on the other hand, the constriction is applied at the level of the lower part of the ninth or tenth rib—the usual level of the female waist—the resulting diminution of accommodation in the upper part of the abdomen will certainly tend to favour a downward slide of the kidney. It appears to me that a daily disturbance of the position of the abdominal viscera, such as may be caused by an unduly tight corset, will favour the occurrence of mobile kidney, and yet I do not plead guilty to regarding the corset as an essential factor in the production of renal displacement. The capacity of the upper part of the abdomen may be diminished in other ways than by constricting the waist. Any muscular effort, such as severe straining in lifting heavy weights, is associated with contraction and fixation of the diaphragm, and will tend to produce the same result, and therefore be liable to increase the range of renal mobility beyond the normal limits; and if the kidney is predisposed to an abnormal range of movement, displacement of the organ may readily be brought about.

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[1] A paper read before the Medico-Chirurgical Society of Edinburgh, March 7, 1907.
[2] *Journ. Am. Med. Ass.*, Chicago, 1901, June 1.

A number of observations have been made by Becker, Lenhoff, Harris, and others on the configuration of the trunk in women in whom the kidneys are normally placed and in those with unduly mobile kidneys. Harris's observations go to show that what he calls the middle zone of the trunk—between the lower end of the sternum and the lowest part of the tenth rib—in which the major portion of the normal kidney should lie—is markedly diminished in capacity in the subjects of movable kidney.

The fasciæ investing the kidney have been variously named and described by anatomists, and some confusion has resulted, without, however, there being any actual difference of opinion on the subject. Dr. Waterson of the Anatomical Department of the University, my assistant Dr. H. J. Norman, and myself, have revised the matter, and we have been able to confirm the description of the layers of perirenal fascia as given by Zuckerkandel, Glantenay, Gerota, Gosset, and others. If the lower ribs are removed so as to display the diaphragm, a thick layer of fascia—the transversalis fascia—is seen to descend from the under-surface of this muscle, and to split into two layers, so as to enclose the suprarenal capsule, the kidney, and the perirenal fat, the space between the two layers being known as Gerota's space. The anterior layer passes in front of the kidney in very close contact with the parietal peritoneum, except where the ureter runs down between them; it ultimately becomes lost in the peritoneum, or may be traced into the corresponding layer of the opposite side. The posterior layer passes behind the kidney and ureter and over the quadratus lumborum and psoas muscles. These two layers, which are described as the anterior and posterior layers of the perirenal fascia, do not fuse with one another on the inner and lower aspects of the kidney, while they do so above and to the outer side.

In cutting down upon the kidney, it is necessary to divide one of these layers of fascia in order to expose the organ; in cutting down from the loin the posterior layer must be divided, while in cutting down from the front by the transperitoneal route, it is the anterior layer which is divided.[1]

It is obvious from the description of this fascia, that when there is any factor tending to move the kidney unduly, there is little or no hindrance to movement in the downward and inward direction, and as the range of movement increases, the parietal peritoneum and the anterior layer of the perirenal fascia are pushed forwards until a larger and larger space is formed in which the kidney is free to move about. This space is analogous to the sac of a hernia, and the operation by which it is intended to close the space below may be regarded as analogous to the obliteration of the neck of the sac in the operative cure of hernia.

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[1] If the reader consults the standard works on surgical anatomy and operative surgery, he will observe the confusion which exists with regard to the relationships of the transversalis fascia to the kidney.

The suprarenal capsule on either side has a definite and assured position on the posterior abdominal wall, and its attachments are so firm that they would easily support the kidney if the two organs were firmly enough fixed to one another. While this is the case in childhood, it is not so in adult life. As development goes on, the suprarenal becomes relatively smaller, and its attachment to the kidney becomes much looser, so that it is no longer able to support the kidney. In the adult the perirenal fat insinuates itself between the kidney and the suprarenal capsule, and the connections between the two are so attenuated that independent movement of the kidney becomes possible.

With regard to the influence of external violence, such as a fall or blow in the region of the kidney, most of the cases recorded as due to such injury will not stand criticism; the relaxation or pouching of the parietal peritoneum, which is always associated with movable kidney, cannot any more than a large hernial sac be produced by violence. It is obvious that a kidney, which is already movable but has not given rise to symptoms, may do so after an injury or after violent exertion.

I have not been able to satisfy myself with regard to the influence of the perirenal fat, either in the direction of preventing renal displacement when it is well developed, or of favouring displacement when it has become absorbed. My impression is that the influence of the perirenal fat depends more on the nature of it, whether it is solid and firm, or whether it is loose and mobile. I have certainly observed kidneys which were remarkably mobile that were embedded in a considerable amount of loose fat.

With regard to the influence of the intra-abdominal pressure, Wolkow and Delitzen, as a result of a large number of experiments on the cadaver, came to the conclusion that the intra-abdominal pressure afforded considerable support to the kidneys.

It is usually stated that the liver supplies the determining factor in the overwhelming predominance of abnormal mobility on the right side; and it would appear from the description of certain authors that the liver pushes the kidney down the smooth gliding surface provided by the psoas muscle as one boy would push another on a sheet of ice. The relationships, however, of the two organs to one another are not so simple. There is, of course, no doubt of the fact that the under and posterior surface of the right lobe of the liver is in contact with that aspect of the right kidney which is directed upwards and outwards; but it would appear to be the case that, when the liver is displaced downwards, a rotation of the organ takes place, so that the upper surface of the right lobe comes to look forwards, and it may therefore be argued that instead of hepatic displacement necessarily producing displacement of the kidney, it might even be held that the rotated liver, by filling up the lower outlet of the renal pouch, might hinder a downward displacement of the kidney, as it would certainly interfere with its palpation.

The fact remains, however, that the relationship of the liver to the right kidney provides one of the accepted explanations of the overwhelming predominance of renal mobility on the right side.

Apart from the presence of the liver, the chief anatomical difference on the two sides is to be found in the position and attachments of the colon. In the case of the left kidney the flexure of the colon is usually at the level of its upper pole, and the flexure is fixed to the parietes by the strong phrenico-colic ligament; the descending colon, which is devoid of a mesentery, follows the outer border of the kidney. On the right side the ascending colon only reaches to a little above the lower pole of the kidney, and the hepatic flexure has no strong attachment to the parietes.

This difference in the position and attachments of the colon and in its peritoneal relationships appears to afford the most reasonable explanation of the predominance of renal displacement on the right side.

Treatment by operation.—It is only in the small proportion of cases in which there are symptoms directly referable to the renal displacement that operative treatment should be recommended, and, as a rule, an attempt should be made in the first instance to keep the kidney in place by means of a belt or a pad and abdominal bandage. With regard to the nature of the operation to be performed, while I have obtained fairly satisfactory results from one or other of the many methods employed for fixing the kidney or its partially reflected capsule by means of sutures, I must declare myself a convert to the procedure which consists in forming a shelf below the unduly mobile organ.

Since last September I have practised it on five occasions, and have followed the lines laid down by Harris of' Chicago in the paper to which I have already referred. The patient lies on his back, or with the support of a pillow under the loin midway between the dorsal and lateral positions. The incision commences at the tip of the twelfth rib, and is continued downwards and forwards in the line of the external oblique muscle; the fibres of the three layers of abdominal muscles are then separated in the *gridiron* fashion suggested by M'Burney, and the transversalis fascia, or, to speak more accurately, the posterior layer of perirenal fascia, is divided, and the space—Gerota's space—in which the kidney lies is opened up. The condition of the organ is investigated, and its range of movement observed, attention being directed to the size of the space in which it lies and the extent to which the anterior layer of perirenal fascia and the parietal peritoneum have been lifted. The perirenal fat, if there be any, should be removed from about the lower pole of the organ so as to permit of the close approximation and union of the fascial structures. The layers which are to be brought together so as to obliterate the lower end of Gerota's space are the parietal peritoneum and anterior layer of the perirenal fascia in front, and the posterior layer of the perirenal fascia and the aponeurosis of origin of the internal oblique and transversalis muscles behind. The parts being held aside by suitable retractors, the stitching is commenced at the deepest part of the wound—interrupted sutures of chromic gut being used—and is continued bit by bit towards the surface until a complete shelf has been formed. Should the space in which the kidney moves be very large, and the parietal peritoneum be lifted up to the inner side of the ascending colon, the peritoneum should be divided in a vertical direction immediately to the outer side of the colon, and the deepest lying sutures are then passed through the peritoneum from within—thus avoiding injury to the bowel or to the vessels distributed to it—and at the same time approximating the parietal peritoneum, both inside and outside the colon, to the posterior abdominal wall. Care should be taken not to include the last dorsal and first lumbar nerves within the grasp of the sutures. The layers of muscle are then approximated, and the wound in the integuments is closed without drainage.

Although in some cases the kidney may be found to occupy a lower position than normal, its capacity for undue movement is completely arrested, although it is still capable of moving slightly up and down, as a normal kidney should during respiration.

The principle of the operation is more efficiently and satisfactorily carried out if the peritoneum is opened outside the line of the colon, and I am inclined to adopt this as a routine practice.

Compared with the pain and discomfort, and in many cases the prolonged sickness and vomiting which follow upon a nephropexy, the patient after the operation above described is, as a rule, no more disturbed than after a herniotomy.

The later results have been excellent, the kidney remaining in place in my cases when examined nine months after the operation, and those recorded by Harris, over two years.

OBSERVATIONS ON THE BLOOD CHANGES SUBSEQUENT TO EXCISION OF THE SPLEEN FOR TRAUMATIC RUPTURE.

By EDWIN MATTHEW, M.B., F.R.C.P.Ed., *Assistant Physician, Leith Hospital;* and ALEXANDER MILES, F.R.C.S.Ed., *Surgeon to Leith Hospital, and Assistant Surgeon, Royal Infirmary, Edinburgh.*

THE removal of the spleen for the effects of trauma is comparatively seldom called for, and when performed the operation is not unfrequently fatal. Opportunities of observing the blood changes which ensue in the human subject after excision of the healthy spleen are therefore rare. As a contribution to the literature of this subject, the following case is recorded:—

CLINICAL NOTES, BY ALEXANDER MILES.

CASE.—The patient was a man, Wm. W., æt. 38, a casual labourer, who, although of very intemperate habits and leading an exceptionally irregular life, always enjoyed good health. In the beginning of February 1905, during a bout of drinking which had lasted for some days, he was "sparring" with a friend in a public bar, and received a stroke with the back of his opponent's open hand under the ribs on the left side. He stated afterwards that he felt a sharp pain at the moment, but as it soon passed off he thought no more about it. On returning to his lodgings he showed no sign of illness beyond what was due to the drink he had taken, but early the next morning he awoke in great pain, cramp-like spasms passing across the upper part of the abdomen, and being especially severe in the pit of the stomach. The pain abated after a time, but throughout the day was sufficient to keep him in bed, and towards evening he was troubled with diarrhœa and vomiting, which lasted, off and on, the whole night. His friends, looking upon these symptoms as the usual after-effects of a debauch, paid no attention to them. During the forenoon of the following day the diarrhœa and vomiting ceased, but a fixed pain in the upper part of the belly persisted, and in addition he suffered from shooting pains radiating towards the chest and the left shoulder. He was then seen by the outdoor surgeon to Leith Hospital, and recommended for admission to the Surgical Wards.

On admission, about 1 o'clock, the pain seemed to be localised to the epigastric and right hypochondriac regions, and on pressure being made over these parts, there was marked tenderness. At this time, however, his chief complaint was of pain below his left shoulder, so severe that he could not move the arm. Above the level of the umbilicus the muscles of the abdominal wall were moderately rigid, but below this level they moved freely with respiration, and pressure did not elicit tenderness. There was no diminution of the liver dulness. The temperature was normal, the pulse about 100 and fairly strong, and the general appearance of the patient was distinctly more suggestive of a commencing septic peritonitis than of an internal hæmorrhage.

Three hours later, as there was no sign of improvement, and as the pulse had lost in quality and become more rapid, it was decided to open the abdomen, the provisional diagnosis being that a gastric or duodenal ulcer had perforated amongst adhesions and caused a limited peritoneal infection.

A vertical incision was made through the inner portion of the right rectus, and, on the peritoneum being opened, some dark-blue thick fluid blood escaped. The stomach and duodenum were examined and found intact, and there was no evidence of perforation of any other portion of the alimentary canal. On the anterior aspect of the right lobe of the liver close to the suspensory ligament, a tear, measuring about an inch and a quarter in length and about a quarter of an inch in depth, was found. This crack was filled by blood clot, and when this was removed the exposed liver tissue began to ooze freely. Two catgut stitches introduced with a round needle and tied tightly at once arrested the bleeding.

On exploring the left side of the abdominal cavity, about a pint of dark tarry blood escaped, and a considerable quantity of firm blood clot was found in the vicinity of the spleen. To gain access to this organ, a horizontal incision was carried outwards through the left rectus. The spleen was found embedded in masses of firm blood clot, and on removing these the organ itself was found in a pulpy condition, the parenchyma being distintegrated and mixed with coagula. The capsule had been bodily stripped off the greater part of the organ. On the removal of the clots the splenic tissue began to ooze very freely, and attempts to arrest the bleeding by sutures failed on account of the friability of the tissue. The spleen was therefore excised, the pedicle being clamped, and ligatured with catgut. There was some bleeding from the gastro-splenic ligament, which, however, was easily controlled by a ligature. Some blood was found free in the pouch of Douglas. The peritoneal cavity having been flushed out with saline solution to remove loose clots, the external wound was closed without drainage.

In spite of the large quantity of blood lost, the patient did not show any marked palor or present any of the usual phenomena of the bloodless state. His subsequent progress was uneventful, save that for some days he was troubled by a persistent cough due to an attack of bronchitis. The wound healed by primary union, save at one point, and here there was a slight bulging, which still persists.

OBSERVATIONS ON THE BLOOD CONDITION AND CHANGES, BY EDWIN MATTHEW.

Observations on the blood in this case have been made altogether over a period of two years and three months. There was no opportunity of obtaining his normal blood condition before the accident, but, except that he had at the time a severe attack of purulent bronchitis, he was evidently a healthy man.

The excised spleen was healthy, and consequently one was afforded an opportunity of studying the immediate and subsequent changes, if any, in the blood following the excision of an organ whose function is at present uncertain.

Beginning on the third day after the operation, careful estimations of the blood were made every day for a fortnight, and subsequently twice a week, until his dismissal six weeks after the operation. The patient disappeared from Leith for a time, but in January 1906, eleven months after his operation, he was under observation for about a month, and his blood examined on three occasions. He was again seen on 4th April of this year, two years and two months after the spleen was removed. Blood estimations were again made.

THE BLOOD CHANGES.—The following table shows at a glance the chief blood estimations immediately following the operation, and at the subsequent intervals of eleven months and two years and two months after:—

TABLE A.—*Showing Number of Red Cells, Hæmoglobin, and Leucocytes.*

Date.	I. Red Cells per cm.	II. Hæmoglobin.	III. Leucocytes per cm.
Feb. 9, 1905	3,800,000	70 per cent.	24,000
,, 10, ,,	3,000,000	75 ,,	24,000
,, 11, ,,	3,000,000	75 ,,	20,000
,, 12, ,,	...	...	16,250
,, 14, ,,	3,300,000	78 ,,	14,000
,, 17, ,,	...	...	10,000
,, 24, ,,	...	...	10,000
,, 26, ,,	3,300,000	75 ,,	10,000
March 5, ,,	...	...	8,000
,, 12, ,,	3,300,000	75 ,,	7,500
,, 19, ,,	3,500,000	...	8,000
,, 28, ,,	3,600,000	75 ,,	8,500
Jan. 10, 1906	3,600,000	80 ,,	10,000
Feb. 19, ,,	4,000,000	78 ,,	9,000
April 4, 1907	4,800,000	85 ,,	8,000

The mere numbers of the cells and the percentage of hæmoglobin do not convey much information, but an analysis of the figures and particularly of those in column III. is of great interest.

The leucocytes.—Immediately following the operation, a leucocytosis was present, lasting, though gradually dimishing, until 14th February. The maximum was 24,000 per cm., reached three days after the excision of the spleen. On 17th February the number of leucocytes had fallen to 10,000 per cm., and from that date right on to the last examination on 4th April of this year, their number fluctuated between 10,000 and 7500. The leucocytosis following the operation and lasting for eight days was partly a post-operative leucocytosis and partly a result of his purulent bronchitis, the fall to 10,000 coinciding with the cessation of his cough. The leucocytosis of 24,000 and less was, as will be seen from Table B, entirely an increase in the polynuclear leucocytes.

On 17th February and subsequently we may say that the total number of leucocytes per cm. was normal.

Table B gives in detail the percentages of the various forms of leucocytes in the counts extending over two years. The films were stained by Jenner's method, and 500 leucocytes were counted on each occasion. No attempt was made to differentiate between small and large lymphocytes, but in the counts over a large series of slides one obtained the general idea that the small lymphocytes were twice as numerous as the large.

Table B.—*Percentage of various Forms of Leucocytes.*

Date.	No. of Leucocytes per cm.	Poly-nuclears.	Small and Large Lymphocytes.	Eosino-philes.	Trans-itional Cells.
Feb. 9, 1905 .	24,000	82	16	0	2
„ 11, „ .	20,000	80	18	0	2
„ 12, „ .	16,250	68	28·5	1	2·5
„ 14, „ .	16,000	58	40	2	0
„ 16, „ .	12,000	51·5	44	4·5	a few
„ 17, „ .	10,000	38	58·5	3·5	„
„ 21, „ .	10,000	37	58·5	4·5	„
„ 24, „ .	10,000	35	60	4	1
March 12, „ .	9,500	37	58	3·5	1·5
„ 16, „ .	9,500	36	60	3·5	0·5
„ 19, „ .	8,500	36·5	60·5	3	a few
Jan. 10, 1906 .	10,000	40	58	2	„
„ 19, „ .	9,000	37	61	1	1
April 4, 1907 .	8,500	38	59	1	2

Analysis of these percentages.—The polynuclear leucocytosis lasted only a few days. Already on the 12th February the lymphocytes had risen to 28·5 per cent. of the total cells. This percentage continued to increase until on the 17th it reached 58·5, a figure which afterwards was maintained in every subsequent examination up to April of this year. In a total of leucocytes amounting to 10,000 this percentage represents not only a relative but an absolute increase in the number of lymphocytes.

Normally the number of lymphocytes may be put at from 20 to 30 per cent. of the total leucocytes, representing a number of from 1000 to 3000 per cm. Choosing a few representative counts, the following Table C shows that here we were dealing with an absolute increase in the number of lymphocytes present. The polynuclear leucocytes maintained during the same time a level somewhat below normal, as can be seen from the Table.

After the excision of the spleen, therefore, in this case we note with regard to the polynuclear leucocytes and the lymphocytes:—

1. Following immediately on the operation a moderate leucocytosis of the usual polynuclear variety.

2. This absolute increase in the polynuclear leucocytes lasted only a few days, and in subsequent observations over two years the polynuclears remained at a level corresponding to the lower boundary of the normal limit.

3. A relative and absolute increase in the lymphocytes became established about twelve days after the operation. This increase has remained at the same level up to two years and two months following the excision of the spleen. The number of lymphocytes per cm. was about double the normal.

TABLE C.—*Showing an absolute Increase in the Number of Lymphocytes present.*

Date.	Total Number of Leucocytes per cm.	No. of Polynuclears per cm.	Lymphocytes per cm.	Eosinophiles per cm.
Feb. 17, 1905. .	10,000	3800	5850	380
,, 21, ,, . .	10,000	3750	5850	450
,, 24, ,, . .	10,000	3500	6000	400
March 12, ,, . .	9,500	3515	5510	230
,, 19, ,, . .	8,500	3181	5142	250
April 4, 1907. .	8,500	3900	6000	85

A fair number of observations have been made on the condition of the blood following excision of the spleen, but chiefly in animals over any lengthened period.

Kurloff made numerous observations on the blood of splenectomised guinea-pigs. As in this case, he found that in a short time a lymphocytosis set in, which existed in some cases three or four years after the removal of the spleen. In the majority, however, he found the lymphæmia diminished in the course of the first year, corresponding evidently to a marked increase in eosinophilic cells. This increase in eosinophiles will be referred to later. Riequer of Breslau published a case in which the lymphocytosis set in about a month after the operation, and at the end of five years was still present, the lymphocytes totalling 33·1 per cent. and the polynuclears 56·8 per cent.

There has just been published by Emery[1] the most complete series of observations so far on a case of splenectomy. They extended over three years. A lymphocytosis set in fairly early, and was maintained with slight variations during that time. At the end of the three years the lymphocytes numbered 44·75 per cent. and the polynuclears 54 per cent.

The eosinophiles.—According to various observers, the number of eosinophiles varies within considerable limits in normal individuals. It is placed by some as low as 0·5 per cent. of the total leucocytes, and by others as high as 5 per cent., or in numbers between 25 and 500 per cm. The latter figure is probably much too high, and 250 per cm. is certainly a fairer average. In this case the eosinophiles showed several marked features. This will be seen from a study of Table B.

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[1] *Lancet*, London, 1907, June 22.

During the polynuclear leucocytosis following the operation, eosinophiles were remarkable by their absence. On 9th, 10th, and 11th February no eosinophiles were found after careful examination. Later, and coincident with the increase in the lymphocytes, the eosinophiles rose suddenly to 4·5 per cent. of the total leucocytes, and the percentage was maintained between 3 and 4·5 until his dismissal six weeks later. It is unfortunate that further observations could not be made for some time afterwards. Eleven months afterwards the eosinophiles had fallen to 2 and 1 per cent., and in April 1907 at the last blood examination they were still 1 per cent. In his experiments on guinea-pigs Kurloff found no such increase in the eosinophiles within the six weeks after splenectomy, but his figures show rather that during the whole of the first year they were, if anything, below normal. During the second year after the splenectomy he found an enormous eosinophilia had set in, the percentage number rising sometimes over 30—representing a very large absolute increase. In this case no such eosinophilia was found in the second year.

Emery in his case found also an absence of eosinophiles immediately following the operation, with a subsequent rise varying from 2 to 4 per cent. He failed also to corroborate Kurloff's enormous increase in the second year. At the end of the third year the number of eosinophiles was 1·20 per cent.

Other leucocytes.—In none of the stained films in this case were any myelocytes seen. Transitional and hyaline cells showed no changes worthy of remark.

The blood plates.—No attempt was made to count the blood plates. In the stained films, from specimens taken during the polynuclear leucocytosis, few were seen. Subsequently, however, and lasting till his dismissal, the most remarkable feature of each film was the enormous number of blood plates that flooded the field, rendering in some cases a differential count difficult, and giving a picture quite unlike anything seen over a considerable experience in blood films.

Eve notes in a case recorded by him that the blood plates were very numerous.

The red cells and hæmoglobin.—The red cells and hæmoglobin were first noted about four days after the operation. There was then a considerable diminution in the number of reds, about 3,000,000 per cm. This loss of 2,000,000 per cm. is probably accounted for by loss of blood, as the result of the ruptured spleen. The hæmoglobin was 70 per cent. The red cells had increased to 3,600,000 by the end of March, and at the last count, two years afterwards, had reached 4,800,000. The hæmoglobin was then only 80 per cent., representing therefore some degree of chlorotic anæmia, probably accounted for by his drinking habits and general state of nourishment. The numbers of red cells and amount of hæmoglobin while in hospital show a very slow and poor regeneration of blood after the operation, and is difficult to account for. Emery in his case found that a year after the excision a polycythæmia set in, the red cells being over 6 millions, and the Hb 102 per cent. No such polycythæmia was found in this case.

General conditions.—The patient made a good recovery from the operation. Though there was very soon evidence, in the absolute rise in the number of lymphocytes, of increased activity of lymphatic tissue while he remained in hospital, no enlargement of the external lymphatic glands could be made out. When next seen in January 1906, he had a few enlarged glands above the clavicle on each side of the neck—none very large—a small mass in the right axilla, and the glands in both groins were slightly enlarged. Fifteen months afterwards the enlarged glands had all disappeared, and no fresh ones were found. Since his operation he has remained perfectly well, though drinking very heavily indeed. He has at no time suffered from symptoms that might be assigned to loss of his spleen. Cases have been described by Balance, Rutherford Morison, and others, where symptoms set in after the loss of the spleen. Patients have suffered from progressive emaciation, epigastric pain, thirst, pyrexia, rapid pulse and respiration, headache and irritability of temper. There has been no evidence of any of these in this case. His thyroid gland has never enlarged.

SUMMARY.—I. From the surgical point of view the points of special interest in this case are:—

1. The comparatively slight degree of violence necessary to rupture the spleen in an alcoholic subject. The blow the patient received was not struck in anger, and all the available evidence went to show that it was not a severe one. Nor was there any reason to believe that the patient met with any violence subsequent to his being struck by his companion.

2. The long interval between the accident and the onset of definite symptoms referable to the splenic injury. This we were inclined to believe was due to the bleeding having been at first sub-capsular, and it was only when the stripped capsule gave way and the blood escaped into the peritoneal cavity that the symptoms attracted attention. In a number of the recorded cases of this injury a considerable time has elapsed between the injury and the onset of alarming symptoms. Due allowance must, of course, in this case be made for the effects of alcohol in dulling the patient's sensations and masking the symptoms.

3. The associated tearing of the liver is difficult to explain, except on the assumption that it was produced by counter-stroke.

4. The difficulty in diagnosis. Apart from the history of injury, the clinical features present when the patient was admitted to hospital all indicated a septic condition rather than one due to loss of blood.

5. The freedom of access afforded by the ⊢ shaped incision was very striking.

II. The clinical changes after extirpation of the spleen are mainly of the blood and lymphatic tissues, namely:—

1. An enlargement of various groups of lymphatic glands occurs. The increase in size sets in early after the operation, is not of any great degree, is probably general, and is not permanent.
2. Corresponding to the lymphatic hyperplasia, there appears in the blood an absolute increase in the number of lymphocytes. This increase persists in man for years after the removal of the spleen.
3. Appearing along with the lymphocyte increase, a moderate eosinophilia is present for some weeks. During this time the blood plates are very numerous.
4. After recovery from the loss of blood, the red cells and hæmoglobin follow a normal course.
5. After excision of the spleen, individuals who recover suffer from no inconvenience; the spleen is consequently not indispensable.

OPERATIVE INJURIES OF THE THORACIC DUCT IN THE NECK.

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Although the thoracic duct, in the neck at least, is not entitled to that respect with which it was formerly regarded, there are probably a number of surgeons and a majority of practitioners who still regard division or even a wound of the duct as a very serious, if not a fatal, injury. So few cases of operative injury of the duct have been published, that one is forced to believe, in view of the increasing frequency of surgical interference at the root of the neck, that many instances have not found their way into print. The accident is one which may happen to any surgeon, and it is important that he should be aware of the proper treatment. Such treatment can only be determined by a study of the results of previous cases. In the present stage of our knowledge, therefore, it is the duty of surgeons to record examples of this lesion, especially noting the extent of the injury to the duct, the treatment, and the result. In giving shortly the notes of a case of my own, it seems not out of place to indicate the conclusions which may be drawn from the experience of various surgeons, and to give as full a list as possible of the hitherto recorded instances of this injury—all the more so because there seems to be no adequate article upon the subject in any of the British or American journals, while I have been able to collect a considerably larger number of cases than are contained in any French or German monograph on the subject. The following are the notes of my case, many details which do not bear on the present subject being omitted:—

CASE.—Female, æt. (in 1907) 35, dressmaker. In September 1903 a doctor removed a tumour from the left mamma; there is no record of its nature. In April 1904 a fungating carcinoma of that mamma was removed in a hospital, only part of the mamma being excised and the axilla not being opened, as the case was regarded as hopeless. In March 1905 she came under my care with a large mass of glands in the left axilla. These I removed, and found microscopically to be typically carcinomatous. Two years later, in March 1907, she appeared again, with a tumour which she had noticed for seven months before seeking advice. This was the size of a plum, situated below and behind the left clavicle, and fixed to the chest wall. One chain of hard glands ran up the middle of the posterior triangle of the neck, and another ran inwards behind the clavicular head of the sterno-mastoid. Breast and axilla showed no recurrence, and the lungs seemed healthy. On 10th March 1907, I removed the tumour along with the middle half of the clavicle, a considerable portion of the two pectoral muscles, and part of the serratus magnus. The ascending chain of glands lay behind the brachial plexus, but were dissected out *en masse*; while the other chain was followed inwards along the axillary and subclavian vessels, behind the common carotid, vagus nerve, and the junction of the internal jugular and subclavian veins, until the finger, passed behind the sternal head of the sterno-mastoid and upper edge of the sternum, felt no more glands. The ascending portion of the thoracic duct was not definitely seen, but was believed to be included in the retractor which raised the above-named structures. A little mass of dense tissue filled up the angle of junction of the internal jugular and subclavian veins, and a lymphatic trunk from the neck could be seen running into this tissue. There was no sign of a single large channel in this angle, and it was assumed that the thoracic duct opened here by numerous twigs in delta-like fashion. At the close of the dissection a drop or two of clear fluid could be seen in this region, which, when swabbed away, slowly reappeared after some minutes. The large wound was closed, and a small drainage tube was brought out through an opening at the anterior border of the axilla.

On the evening of the second day (*i.e.* within sixty hours of the operation) the large cotton-wool dressing was soaked, and possessed the unpleasant, mawkish odour imparted by warm blood serum or lymph. The wound was dressed, and a turbid, almost milky, fluid dropped from the tube. Several c.c.'s of this fluid were collected in a few minutes, and a report upon it from the Laboratory of the Royal College of Physicians of Edinburgh stated that it was probably from the thoracic duct. On the third day, *i.e.* at the second dressing, the tube was removed, and a pad incorporated in the dressing so as to exercise supraclavicular pressure, the fluid escaping down the tube track and also at a corner of the wound, where a tiny opening formed. It is difficult to estimate the amount of fluid which escaped, but daily dressing was required, and, in spite of a large wool-dressing, extra pads of wool had to be applied once or twice in the intervals. The quantity and turbidity of the fluid rapidly diminished. By the twelfth day there was only a very slight discharge of clear straw-coloured fluid, not much more than one would expect from a granulating cavity, and the dressings were only changed on alternate days. By the twenty-second day there was only a faint staining of the inner surface of the gauze; on the twenty-eighth day even this had disappeared, and on the thirty-second the wound was soundly healed. There were throughout no local or general signs of sepsis, and the patient's general health did not appear to suffer; indeed, although always a thin and anæmic woman, she recovered rapidly from the first in spite of the severity of the operation.

The facts of this case point to it as an example of operative injury of the thoracic duct, possibly by a wound in the ascending trunk or one of its divisions, more probably by section of some of the terminal branches in a delta-like insertion. The treatment was for three days drainage by a tube (which would not have been employed had the injury been recognised at the operation), thereafter supraclavicular pressure, with a certain amount of unavoidable drainage down the tube track and through one corner of the scar. The discharge from the duct may be regarded as having ceased by about the fifteenth day. There was no constitutional disturbance, and the patient made a good recovery.

Anatomy of the Thoracic Duct.—NORMAL ANATOMY.—A knowledge of the normal anatomy, and still more of the variations, is essential in order to understand the surgery of the subject. The ordinary text-book description can be given in a few lines. Starting in the receptaculum chyli on the front of the body of the second lumbar vertebra, the thoracic duct passes through the aortic opening in the diaphragm, ascends in the posterior mediastinum between the vena azygos major and the aorta, inclines to the left opposite the fourth dorsal vertebra, and passes upwards on the left side of the œsophagus behind the arch of the aorta and the first part of the left subclavian artery. Reaching the root of the neck, it turns outwards at the level of the seventh cervical vertebra, and then curves downwards over the subclavian artery and in front of the scalenus anticus muscle, finally passing behind the internal jugular vein and opening into the angle of junction of the internal jugular and subclavian veins. An anatomical point of some importance, indicated by Lecène, is that the thoracic duct lies in front of the aponeurosis of the scalene muscles, and strips easily off it, while the important underlying structures, such as the phrenic nerve and brachial plexus, are firmly fixed down by this aponeurosis. The result is that the surgeon, in following glands inwards, strips them with comparative ease and safety off the deeper structures, but is apt to tear the thoracic duct.

VARIATIONS IN ANATOMY.—(1) *Variations in the level of its arch in the neck.*—The highest point of the terminal arch may be low, the curve being very flat. On the other hand, the duct may extend unusually high, sometimes to the level of the fifth cervical vertebra; indeed, Dietrich[1] has found the arch 5½ cms. above the top of the sternum, and touching the thyroid gland. This situation naturally renders the duct more liable to injury, by bringing it into a more frequently traversed field of surgical interference.

(2) *Variations in its connection with the venous system.*—The typical description of the thoracic duct as a single channel throughout its course may almost be regarded as a description of an abnormality, so frequently is it found to branch and subdivide. In its thoracic portion it is very common to find it breaking up into two divisions, which reunite higher, enclosing a space technically named an "insula," which is often crossed by a plexus of communicating channels. Rarely the duct may remain double throughout. These insulæ in the thorax are surgically unimportant, but the same tendency may manifest itself at the termination of the duct in the neck, so that it either opens in a delta-like manner by several fine channels in its usual situation, or actually terminates in two or more important branches, which enter different veins. Teichmann regards this multiple insertion as normal. Not uncommonly one branch enters the left subclavian vein, while another joins the left internal jugular; sometimes they enter the right and the left subclavian respectively. Verneuil[2] records a sixfold division, two branches ending in the left subclavian, two in the external jugular, and two in the vertebral. Verneuil quotes the results of Boullard's researches, namely, that in twenty-four cases the opening of the duct was eighteen times single, thrice double, twice triple, and once sixfold. Wendel,[3] in seventeen cases, once found the opening triple, thrice double, while in four instances there were "several branches."

A second abnormality in the relation of the thoracic duct to the great veins is that it may, while terminating in a single channel, open in some more or less unusual situation. Thus it may enter the left subclavian vein, the left internal jugular, the right internal jugular, or the right subclavian; in the last case the right lymphatic duct generally ends in the veins of the left side of the neck. Wutzer[1] reports a case of its termination in the vena azygos major at the sixth dorsal vertebra, and Henle, who had doubts with respect to several similar recorded instances, regards Wutzer's case as undeniable.

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[1] "Das Aufsuchen der Schlagadern," Nürnberg, 1831, p. 154. Also Henle's "Anatomy," 1876, Bd. iii. S. 453.

[2] "Le Système Veineux," 1855.

[3] *Deutsche Ztschr. f. Chir.*, Leipzig, 1898, Bd. xlviii. S. 437.

A third and extremely important point is the frequent existence of communications between the thoracic duct and various veins during the upward course of the former through the abdomen and thorax. This we might expect from a study of comparative anatomy, for in birds lymphatics of the lower extremities open into the veins of the thigh and pelvis; in amphibians and fish analogous lymphatics have a corresponding ending; and in the pig there are said to be regular communications between the thoracic duct and the azygos vein. In man Wendel regards a branch between the duct and the azygos major as almost a normal condition. Connections with the iliac and lumbar veins, the inferior vena cava, and the left renal vein through the lumbar lymphatics have also been observed. In some of the older cases it is possible that there had been pressure on the duct above, and that these connecting vessels had originally possessed only a tiny lumen. A good account of the variations in the thoracic duct in this and other respects is contained in the volume by Poirier, Cunéo, and Delamere.[2]

The great surgical importance of these three types of variations in the relations of the thoracic duct to the venous system will be at once evident. When, for example, the trunk opens in an abnormal situation, the surgeon may cut it before he is aware of its presence, this being an unfavourable deviation from the normal anatomy. The other two variations mentioned have, on the contrary, a favourable influence on the prognosis in wounds of the thoracic duct. Should the duct possess multiple terminal branches, it is obvious that one of these may be divided, and a profuse escape of chyle ensue, while the other terminals are still conveying an ample supply into the circulation. Even should complete section occur of a duct which has only a single ending, there is usually a sufficient number of thoracic or abdominal communications with the venous system to prevent that death from inanition which the older surgical writers regarded as the inevitable consequence of division of the great chyle-conducting trunk. These communications are probably in many cases enlarged, owing to pressure upon the duct near its termination by the tumour or enlarged glands for which the operation is performed.

Operative Injuries of the Thoracic Duct.—A few instances of non-operative traumatic injury of the duct have been recorded, due to such causes as a stab, a bullet wound, or fracture of the vertebral column. These are very rare, and are only of academic interest; it is proposed, therefore, to confine this résumé to injuries occurring during surgical operations, all of which refer to the cervical portion of the duct. Various collections of such cases have been published. Lecène gives twenty-two cases, von Graff twenty-six, and Allen and Briggs[1] fifteen. I have, however, been able to find forty-two apparently well-authenticated instances of this condition, a list of which, with a brief summary of each and the references to the literature of the subject, is appended to this article. I have been unable to gain access to the publications containing two of these cases, those of Thorne and Calgolari, and have therefore only dealt with the other forty. A table is first given indicating shortly the main facts brought out by these forty cases, and then these facts are discussed in more detail.

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[1] *Arch. f. Anat. Physiol. u. wissensch. Med.*, Berlin, 1834, S. 311.

[2] "The Lymphatics," by Poirier, Cunéo, and Delamere, translated and edited by Cecil H. Leaf, 1903.

Table of Cases of Operative Injury of the Thoracic Duct.

1. Disease for which Operation was performed.

Tuberculous glands	16
Malignant disease	20
Tumours of neck (nature not definitely stated)	2
Enlarged glands (nature not stated)	1
No details	1
	40

2. Recognition or Non-recognition of the Accident during the Operation.

Injury to thoracic duct recognised	26
Injury to thoracic duct not recognised	13
No details	1
	40

3. Subsequent History as regards Chylorrhœa.

No subsequent chylorrhœa			14
Subcutaneous accumulation, reabsorbed later			2
Chylorrhœa	Checked, without further operation, by pressure or packing (average duration, 13·6 days)	16	
	Checked by further operation (ligature, etc.)	4	
	Continued till death	3	
			23
No details			1
			40

4. Ultimate Result.

Recovery	35
Death	5
	40

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[1] *Amer. Med.*, 1901, September 14.

5. Treatment adopted and its Results.

Ligature	Primary	No chylorrhœa	10	
		Chylorrhœa (average duration, 8·5 days)	2	
	Secondary	No chylorrhœa	2	
		Death	1	15
Suture (primary)		No chylorrhœa	1	
		Chylorrhœa (average duration, 8·5 days)	2	3
Forcipressure		Primary—Chylorrhœa (4 days)	1	
		Secondary—No chylorrhœa	2	3
Packing		No chylorrhœa	2	
		Chylorrhœa (average duration, 18 days)	7	
		Death	2	11
External pressure	Wound closed—Accumulation reabsorbed		2	
	Wound not closed	No chylorrhœa	1	
		Chylorrhœa (15 days)	1	4
Implantation into internal jugular vein—No chylorrhœa (?)				1
No details				3
				40

Let us now consider in more detail the facts and figures collected in this table.

1. Disease for which the Operation was performed.—Most of the cases come under the headings of tuberculous glands in the neck and malignant disease. The latter, in the great majority of instances, is a recurrence at the lowest part of the posterior triangle of the neck, following upon a previously removed carcinoma of the mamma. The duct is equally liable to be injured whether sharp or blunt dissection be employed. The glands are being followed inwards, and, as those situated deeply at the inner end of the clavicle are reached, traction is made upon them in order to render them more accessible. Eventually the last gland is dissected out until it is attached only by what appears to be a narrow neck of areolar tissue which the surgeon cuts with a sigh of relief at the successful completion of a difficult operation. The thoracic duct, as a result of the traction on the chain of glands, had been pulled outwards, and is either completely divided or a portion of one wall is cut out. Blunt dissection is equally dangerous, for one of the main tributaries of the duct, which runs along with the glands, may be torn away, leaving a hole in the wall, just as not infrequently a hole is made in the internal jugular vein by pulling upon a small vein close to the main vessel. There is no way of avoiding such accidents except by exercising the greatest care when working in the region of the thoracic duct. Should the duct ascend abnormally high in the neck, or should it be inserted into the subclavian vein at some distance out from the internal jugular, it may be injured by a surgeon who naturally assumes that he has not reached the

dangerous area. In other cases, where the duct has more than one terminal channel, one of these may in this way be divided.

2. SIGNS OR SYMPTOMS POINTING TO INJURY OF THE THORACIC DUCT.—How may the occurrence of the injury be recognised (1) during the operation, and (2) after the operation, should it escape notice at the time?

(1) *During the operation.*—The characteristic sign is the sudden flooding of the wound with a fluid which may be almost clear, as the patient has usually had no food for some hours, or clear but mingled with whitish threads, or distinctly milky like skimmed milk or milk mixed with water. Frequently a search reveals the cut end of the duct or a wound in the wall, from which the fluid escapes; and it is interesting to note that this escape is frequently rhythmical, a little jet being expelled at each expiration, showing how important a part the respiratory movements play in the propulsion of chyle through a vessel whose walls are very sparsely supplied with muscular tissue.

(2) *After the operation.*—Should the injury to the thoracic duct escape the notice of the surgeon during the operation, it is subsequently brought to his notice in one of two ways. In the one class of cases, especially where no drainage has been employed, there are no symptoms pointing to anything unusual, until the wound is dressed for the first time, when a large effusion is found raising the skin in the supraclavicular region. This is generally regarded as due to blood, but on opening a corner of the wound a whitish liquid escapes, which has on several occasions been mistaken for pus, and for a longer or shorter period a fistula is established, from which there is a copious lymphorrhœa or chylorrhœa. This subcutaneous effusion is thus discovered in many cases about the sixth to the eighth day, though in Halsted's case it was not present on the fifth day, but was present at the next dressing five days later. The wisdom or otherwise of letting out such accumulations will be referred to under the heading of treatment.

The other way in which the wound of the duct reveals itself after operation, especially where a drain has been inserted, is by a profuse chylorrhœa which soaks the dressings, and sometimes the bed, with a milky fluid possessing a sweet or mawkish odour like that of blood serum. This discharge may show itself within a few hours, or it may not appear till one, two, or more days after operation. The reasons for this delay are not very evident. It may be due to the fact that a patient as a rule gets very little nourishment for the first twenty-four hours; or that the escape of a certain quantity of the contents of the duct may augment, without altering much, the ordinary discharge from the wound. Vautrin suggests that the injury may cause a reflex spasm or contraction of the walls of the lymphatics, which for a time obliterates their lumen. However the chylous fistula may arise, it produces in most instances a very definite train of symptoms. Emaciation is rapid and progressive—Halsted's case losing about 10 lb. in a week—and is accompanied by general lassitude and dejection, feebleness, pallor, great thirst, scantiness of urine, and sometimes tachycardia, headache, giddiness, and syncope. There is constant hunger, the food as a rule being well borne by the stomach, and the discharge from the fistula becomes more milky during the period of digestion and absorption. The amount of the escaping fluid varies, being in some cases estimated at "several litres." If measures adopted to stop the discharge are successful, the patient puts on fat as rapidly as he lost it, and the other symptoms immediately disappear. Some cases are recorded in which, notwithstanding a copious chylorrhœa, the patient's health seemed to be hardly affected; the presumption is that these are instances of terminal branching of the thoracic duct, only one of the branches having been divided, or that the intrathoracic venous connections of the duct are sufficiently large—whether naturally or from pressure of the tumour on the duct causing distention of channels behind the obstruction—to maintain the nourishment of the body. It is especially to be noted that accumulation of chyle in a wound, or a constant discharge of chyle from it, is *not* accompanied by any local inflammatory signs or any feverish symptoms, provided sepsis is prevented. This fact is of some importance when we come to consider later the fatal cases.

3. SUBSEQUENT HISTORY AS REGARDS CHYLORRHŒA.—In fourteen cases there was no post-operative chylorrhœa. In all of these, the wound of the duct was recognised during the operation; so that—to put the statement in another form—every case in which the injury was not recognised was attended by a troublesome post-operative escape of the contents of the duct. One apparent exception is the case recorded by Brohl of Köln, who, in removing a melanotic sarcoma, ligatured the external and internal jugular, and the left subclavian and innominate veins, and plugged the wound. On afterwards examining the preparation removed, he found in it a portion of the thoracic duct. Strictly speaking, he was unaware that the duct was injured, but practically this made no difference, as the duct was probably included in his ligature, in addition to the wound being packed; perhaps also the duct had been previously occluded by the growth of the tumour. The procedures adopted in these fourteen cases were as follows:—Primary ligature, 10; packing, 2; primary suture, 1; forcipressure and packing, 1.

Coming next to the cases in which there was a post-operative escape of the contents of the thoracic duct, we find that in two, operated upon by Cheyne or Burghard, the wound of the duct was recognised but disregarded, the skin wound tightly sutured, and pressure applied outside. In both cases a large fluctuating swelling formed, which disappeared in "some weeks" and "a couple of months" respectively. In twenty-three cases there was an escape of chyle externally. In sixteen of these twenty-three the flow gradually ceased without any more severe measures than pressure or packing being employed, the duration varying from two days in Keen's case to four or five weeks in others, and the average duration of the chylous discharge being 13·6 days. In three cases the flow continued till death, which took place on the thirty-eighth, nineteenth, and thirteenth day respectively. In the remaining four cases the escape of chyle was arrested by reopening the wound, and in two cases applying a ligature to the torn duct, in the other two leaving on forceps.

4. ULTIMATE RESULT.—Death occurred in five cases, recovery in thirty-five, giving a mortality of 12·5 per cent. This is very different from such statements as "invariably fatal" or "in every case death must follow," which occur in well-known surgical text-books published well within the last decade, where the true anatomy of the thoracic duct has not been appreciated. Low, comparatively speaking, as this mortality is, I believe that a study of the details of the five fatal cases will raise more than a doubt as to whether in some, if not in most of them, the wound of the thoracic duct was the direct cause of death.

(1) Cheever removed a malignant tumour of the neck, ligaturing the subclavian vein, and lightly packed the wound. The patient died in thirty-six hours "from shock and exhaustion," no chyle having escaped after the operation. Clearly this case should be removed from amongst thoracic duct fatalities. (2) In Vautrin's fatal case—the details of which will be found at the end of this paper—the temperature thirty-six hours after operation rose to 38° (100°·4 F.), pulse to 90, and the wound was swollen, red, and surrounded by œdema. Thrice the wound was reopened, the duct isolated, and either a ligature or forceps applied, but in each case the effect on the flow was only temporary, the ligature slipping or cutting through the duct. The patient died on the thirty-eighth day, and even on the fifteenth or sixteenth day "pulmonary congestion and cardiac troubles" are noted, while after the thirty-second day we hear of intense pulmonary congestion and extreme dyspnœa, pulse 130–140, cold sweats, urine scanty. Remembering the fact already stated, that wounds of the thoracic duct do not *per se* cause local inflammatory signs or general feverish symptoms, one can hardly avoid regarding the case as one of infection of the wound at the original operation, followed by an extension of the infection down into the thorax, just as happens in the cellulitis due to extravasation from the œsophagus, causing pulmonary involvement and sapræmia or septicæmia. If this is true, then the recurrence of the "lymphorrhagia," owing to the ligatures cutting through the wall of the duct, is simply a further sequela of wound infection exactly comparable to an ordinary secondary hæmorrhage. It seems a little hard on the thoracic duct to lay this death to its account. (3) Schopf

states definitely in his case that suppuration occurred, and his patient died with a double chylothorax. (4) The case of Erasmus-Niermann was an old man of 70, who had an abundant thoracic lymphorrhœa, and, in the words of Vautrin, who quotes the case, "died on the thirteenth day of weakness." (5) Jacobson, giving no details, says, "In 1870 I saw the thoracic duct opened in an operation . . . . and the case soon ended fatally."

How many of these deaths can be attributed to the wound of the thoracic duct? Cheever's case may be at once set aside, and it does not seem unfair to do the same with Vautrin's. In the other three cases there are at least other possible factors. Schopf's case was septic, Jacobson's occurred at a date when aseptic methods had not reached their present level, and the Erasmus-Niermann case was an old man of 70, upon whom a presumably serious operation had been performed. I think, therefore, that if we exclude the first two of the five cases, and include all of the last three in the list of fatalities attributable to wound of the thoracic duct, we are not favouring the duct unduly—indeed, probably the reverse. Three deaths in forty cases will then give a mortality of 7·5 per cent.

5. METHODS OF TREATMENT AND THEIR COMPARATIVE RESULTS.—A glance at the table shows that *ligature* of the wounded duct is an extremely safe and satisfactory procedure. Apart from Vautrin's fatal case, which we have already discussed and excluded, this method has been employed on fourteen occasions—twice after packing had been tried without result—and has always been followed by recovery, while only twice did it fail to instantaneously and permanently arrest the flow of chyle from the wound. In one unsuccessful case (Schönborn, reported by Weischer) the ligature was probably improperly applied, or another branch of the duct had been cut, for the flow appears to have been re-established at once: it stopped seven days later. Ligature of the peripheral end of the duct is sufficient, the opening or openings of the central end into the venous system being guarded by valves which prevent any regurgitation of blood. In some cases the ligature has been lateral, in others a complete ligature of the duct. *Suture* with fine silk was successfully performed by Cushing. Porter and Keen have also used this method, but chylorrhœa resulted for fifteen and two days respectively. In Porter's case, however, the suture was admittedly imperfect, as it did not even at the time arrest the flow. *Forcipressure* has been tried three times, the forceps being left on the duct. Once this was done at the operation (reported by Wendel), and there was still some discharge for four days; twice forceps were applied as a secondary procedure with complete success. *Packing* has been only moderately successful. We must hold it partly at least responsible for the death of Schopf's patient, though not for that of Cheever's case. Only twice has it at once stopped the flow of chyle

(Halsted; Wilms' case reported by Boegehold); while in seven cases the flow has continued for a period varying from two days up to five weeks or more, the average being eighteen days. *Supraclavicular pressure* was used by Cheyne and Burghard in two cases of subcutaneous effusion without external discharge, and in both this slowly disappeared. It has also been twice deliberately employed as the only treatment in the presence of a chylous discharge: in Ricard's case the discharge immediately ceased, in my own case it continued for about fifteen days. Lastly, one surgeon alone (Deanesly) has *implanted the peripheral end of the thoracic duct into the internal jugular vein.* The vein had been ligatured in two places at an earlier stage of the operation, and the duct was stitched into the portion between the ligatures, which, however, possessed collateral branches. On the first day there was a considerable "albuminous discharge," which "seemed larger in amount than the ordinary wound serum"; on the second day there was comparatively little, and none thereafter.

Conclusions.—The anatomy of the thoracic duct suggests that a wound or complete division of it in the neck need not, in most cases, be attended by serious consequences.

Surgical experience proves that, in an aseptic wound and with proper treatment, such injuries are rarely fatal, and if the injury is recognised during the operation, are rarely followed by even a temporary chylous fistula.

The best treatment, if the wound of the thoracic duct is recognised during the operation, is ligature of the peripheral end; ligature of the central end in addition is in most cases unnecessary, but can do no harm. Suture of a wound in the duct is worth attempting only in very favourable cases. Packing is only justifiable if the surgeon is unable to apply a ligature.

The best treatment, if the wound of the thoracic duct is not recognised till after the operation, is probably firm packing of the wound, which almost invariably results in cure with or without a comparatively short-lived fistula. Firm supraclavicular external pressure may be successful if the wound is firmly closed, and may also be successful even if the wound is not closed; there have been too few cases of this treatment to allow of a definite expression of opinion upon it. Probably where the accumulation in a closed wound is recognised as being chylous, supraclavicular pressure—the accumulation being left *in situ*—will be a safe and satisfactory method. The wound may be reopened, and a ligature or forceps applied to the duct, usually with complete success; but this is a difficult procedure, and hardly justifiable unless packing has been tried and has failed.

Operative injuries of the thoracic duct are probably far commoner than is generally imagined. In many cases pieces of tissue are clamped before division, and then ligatured, and it is likely that in some of these cases, wound or division of the duct takes place, but is never suspected because of the previous application of the ligature.

The following is a short summary of the forty-two cases referred to in this article, along with the journals in which they were published. For convenience of reference the cases are arranged alphabetically:—

RECORDED CASES OF OPERATIVE INJURY OF THE THORACIC DUCT.

1. Brohl, *Centralbl. f. Chir.*, Leipzig, 1896, No. 17, S. 408.

Woman, æt. 52.—*Melanotic sarcoma.*—Left internal jugular, subclavian, and innominate veins ligatured; wound packed; piece of thoracic duct in the tissue removed. Uneventful recovery. Schopf writes, "Brohl *ligatured* the duct with the veins" (*vide* Schopf's article).

2. Bucknall, *Brit. Med. Journ.*, London, 1905, vol. ii. p. 809.

Man, æt. 54.—*Tuberculous glands.*—Injury to duct unnoticed; wound closed; chylorrhœa discovered in twenty-four hours; lasted till on sixth day wound opened; both ends of torn duct ligatured. Then uneventful recovery.

3. Id., *ibid.*

Woman, æt. 62.—*Malignant glands, recurrence from carcinoma mammæ,* "involving the thoracic duct and obliterating its lumen"; excised; both ends of duct ligatured. Uneventful recovery.

4. Calgolari, *Gazz. d. osp. e. d. clin.*, Milano, 1900.

(Unable to obtain this journal. Case is merely named in von Graff's article.)

5. Cheever, *Boston Med. and S. Journ.*, 1875, p. 422; *vide* also Keen's article.

Man, æt. 22.—*Malignant tumour of neck.*—Injury recognised; wound "lightly packed with sponges and ferric alum"; no chylorrhœa. Death in thirty-six hours "from shock and exhaustion."

6. Cheyne and Burghard, "Surgical Treatment," Pt. 2, p. 173.

Tuberculous glands.—Injury recognised; skin wound tightly sutured, pressure outside; after discontinuance of pressure, fluctuating swelling formed, but "after some weeks" suddenly disappeared.

7. Id., *ibid.*

Malignant glands in neck.—Injury recognised; tissues sutured over wound in duct; otherwise same as last case. Swelling had disappeared in "about a couple of months."

8. Cushing, *Ann. Surg.*, Phila., 1898, vol. xxvii. p. 719.

Woman, æt. 62.—*Malignant glands, recurrence from carcinoma mammæ.*—Longitudinal wound of 3 mm.; suture with fine silk. Uneventful recovery.

9. **DEANESLY**,[1] *Lancet*, London, 1903, vol. ii. p. 1783.

Woman, æt. 34.—*Tuberculous glands.*—Complete division of duct; peripheral end of duct implanted into internal jugular vein; small drain. In twenty-four hours "rather copious albuminous discharge"; none after second day.

10. **VON EISELSBERG**, reported by von Graff, *Wien. klin. Wchnschr.*, 1905, S. 10.

Girl, æt. 13.—*Tuberculous glands.*—Injury recognised; ligature. Uneventful recovery.

11. **ERASMUS-NIERMANN**, "Thesis of Leipzig, 1901," quoted in Vautrin's article.

Man, æt. 70.—*Tumour of neck.*—"Died on thirteenth day from abundant thoracic lymphorrhœa."

12. **FAURE**, *Bull. et mém. Soc. de chir. de Paris*, 1903, tome xxix. p. 991.

Woman, æt. 36.—*Malignant tumour.*—Small wound in duct noticed; lateral ligature; drainage; on fourth day wound swollen, red, etc.; opened. Chylorrhœa till tenth day.

13. **FULLARTON**, *Brit. Med. Journ.*, London, 1906, June 16, p. 1389.

Woman, æt. 24.—*Tuberculous glands.*—Duct terminated by three mouths; divided distal to branching; both ends ligatured. Uneventful recovery.

14. **HALSTED**, quoted by Cushing, *loc. cit.*

Woman, æt. 66.—*Carcinoma mammæ with supraclavicular glands.*—Injury unnoticed; wound closed; on fifth day wound healed; on tenth a supraclavicular swelling; opened; chylorrhœa; on eighteenth day opened and packed. No further trouble.

15. **JACOBSON** and **STEWARD**, "The Operations of Surgery," vol. i. p. 558.

Enlarged glands.—Date 1870. "Chyle escaped deep down in the wound, and the case soon ended fatally." No further details.

16. **JESSETT**, reported by Keyser, *Lancet*, London, 1904, vol. ii. p. 1215.

Woman, æt. 50.—*Malignant glands, recurrence from carcinoma mammæ.*—Injury unnoticed; chylorrhœa for a fortnight, "and then gradually ceased."

17. **KEEN**, *Ann. Surg.*, Phila., 1894, vol. xx. p. 87.

Woman, æt. 20.—*Tuberculous glands.*—Tear ¼ in. long noticed; suture with fine silk; "some little leakage still took place"; drain for five hours. Chylorrhœa lasted two days.

18. **LECÈNE**, *Rev. de chir.*, Paris, 1904, tome xxx. p. 743.

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[1] Included in table on p. 306 as "no chylorrhœa." *Vide* p. 312.

Man, æt. 16.—*Tuberculous glands.*—Injury recognised; ligature; drain ten days. Uneventful recovery.

19. Lesniowski, *Medycyna*, Warszawa, 1899, Nos. 1 to 3; also abstract in *Centralbl. f. Chir.*, Leipzig, 1900, Bd. xxvii. S. 86.

Woman, æt. 30.—*Tuberculous gland.*—Injury of duct diagnosed at operation but not found; packed; chylorrhœa fourteen days. Recovery.

20. Id., *ibid.*

Tuberculous glands.—Injury recognised; ligature. Uneventful recovery.

21. Maas, reported by Vagedes, "Inaug. Diss.," Würzburg, 1885, quoted by Cushing, *loc. cit.*

Parotid sarcoma and glands.—Injury unnoticed; packed; chylorrhœa six days; then reopened; packed. Cessation of chylorrhœa.

22. Phelps, personal communication to Keen, *loc. cit.*

Man.—*Malignant tumour.*—Injury unnoticed; chylorrhœa; wound reopened; injury found; forceps applied and left in for three days. Cessation of chylorrhœa.

23. Porter, personal communication to Cushing, *loc. cit.*

Tuberculous glands.—Injury recognised; suture, but still leakage; chylorrhœa fifteen days. Spontaneous cessation.

24. Ricard, *Bull. et mém. Soc. de chir. de Paris*, 1901, tome xxvii. p. 758.

Fibrous tumour of thyroid.—Injury unnoticed; swelling discovered on sixth day; opened; chylorrhœa; on fifteenth day drainage stopped, external pressure applied. No further chylorrhœa.

25. Schönborn, reported by Weischer, *Deutsche Ztschr. f. Chir.*, Leipzig, 1894, Bd. xxxviii. S. 487.

Girl, æt. 14.—*Tuberculous glands.*—Tear in duct noticed; duct divided, both ends ligatured; packing; chylorrhœa seven days. Spontaneous cessation.

26. Schopf, *Wien. klin. Wchnschr.*, 1901, S. 1169.

Woman, æt. 49.—*Adeno-carcinoma of mamma with glands.*—Injury unnoticed; drain; chylorrhœa; suppuration; cyanosis and other general symptoms. Death on nineteenth day. *Post-mortem.*—Double chylothorax.

27. Schroeder and Plummer, *Ann. Surg.*, Phila., 1898, vol. xxviii. p. 229.

Man, æt. 24.—*Tuberculous glands.*—Injury recognised; unsuccessful attempts to ligature it; packing; chylorrhœa[1] abundant for three weeks; very slight discharge (septic?) three months later, when patient was lost sight of.

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[1] In the table chylorrhœa has been considered as lasting for forty days; later discharge probably from sepsis.

28. Id., *ibid.*

Woman, æt. 59.—*Tuberculous glands.*—One large wound in duct and two smaller ones; all ligatured. Uneventful recovery.

29. Schwinn, *Ann. Surg.*, Phila., 1896, vol. xxiii. p. 582.

Man, æt. 25.—*Tuberculous glands.*—Injury unnoticed; swelling on tenth day opened; chylorrhœa; compression; packing; grave symptoms; reopened, found injury, applied forceps. Thereafter, uneventful recovery.

30. Stuart.

Woman, æt. 35.—*Malignant glands, recurrence from carcinoma mammæ.*—Injury not recognised; drainage three days; chylorrhœa about fifteen days; pressure. Recovery.

31. Thöle, *Deutsche Ztschr. f. Chir.*, Leipzig, 1901, Bd. lviii. S. 101.

Tuberculous glands.—Injury unnoticed; packing; chylorrhœa; grave symptoms; reopened on third day; ligature of distal end of duct; cessation of chylorrhœa. Recovery.

32. Thorne, *Guy's Hosp. Gaz.*, London, 1896, vol. x. p. 202.

(Unable to obtain this paper.)

33. Vautrin, *Rev. de chir.*, Paris, 1905, tome xxxii. p. 1.

Woman, æt. 49.—*Recurrence from carcinoma mammæ.*—Injury unnoticed; drain; chylorrhœa; (sepsis?); packing failed; pulmonary and cardiac complications; reopened on fifteenth day (lateral ligature), thirtieth day (division of duct and ligature), and thirty-seventh day (forceps left on). Death on thirty-eighth day.

34. Id., *ibid.*

Woman, æt. 65.—*Recurrence from carcinoma mammæ.*—Ligature. Uneventful recovery.

35. Id., *ibid.*

Carcinoma mammæ.—Lateral opening in duct; isolated and ligatured. Uneventful recovery.

36. Id., *ibid.*

Malignant glands in neck.—Ligature of duct. Recovery. (Author gives no details.)

37. Wendel (from Küster's patients), *Deutsche Ztschr. f. Chir.*, Leipzig, 1898, Bd. xlviii. S. 437.

Woman, æt. 59.—*Recurrence from carcinoma mammæ.*—"Pin-head sized" opening seen in duct; packing; chylorrhœa; on second day suture of soft parts over the opening. Thereafter, uneventful recovery.

38. Id., *ibid.*

Man, æt. 45.—*Recurrence of carcinoma of neck.*—Injury recognised; packing; chylorrhœa; on fourth day suture of soft parts over opening. Chylorrhœa till nineteenth day.

39. Id., *ibid.*

Woman, æt. 25.—*Tuberculous glands.*—Injury recognised; forceps failed to stop flow; packed; chylorrhœa; repeated attempts to close duct with forceps failed; packing continued. Ceased on fifth day.

40. Id., *ibid.*

Woman, æt. 32.—*Malignant lymphoma.*—Injury recognised; two forceps applied; moderate chylorrhœa; packing on third day. Cessation of chylorrhœa on fourth day.

41. Id., *ibid.*

Woman, æt. 34.—*Recurrence from carcinoma mammæ.*—Injury unnoticed; packing; chylorrhœa; subsequently forceps applied near fistula, and various sutures over and around it (slit seen in duct—too deep to suture); packing; chylorrhœa ceased on forty-second day. Recovery.

42. Wilms (reported by Boegehold), *Arch. f. klin. Chir.*, Berlin, 1883, Bd. xxix. S. 443.

Man, æt. 45.—*Malignant tumour of neck.*—Injury recognised; packing; no chylorrhœa. Uneventful recovery.

The following references are also of interest in connection with this subject:—

Beneteau, Thèse de Paris, 1892, "Plaies du canal thoracique à la base du cou."

Veau, *Gaz. d. hôp.*, Paris, 1902, p, 1205.

Allen and Briggs, *Am. Med.*, Phila., 1901, September 14.

THE SKIAGRAPHY OF RHEUMATOID ARTHRITIS.

By George E. Bowker, M.D. (Edin.), *Senior Assistant Physician, Royal United Hospital, Bath*; and James Lindsay, M.D. (Edin.), *Resident Medical Officer, Royal Mineral Water Hospital, Bath.*

(Plates V. and VI.)

For many years all polyarthritic affections, which are neither acute rheumatism on the one hand, nor unequivocal gout on the other, but presenting features somewhat resembling them, have been grouped together under the term rheumatoid arthritis. Many physicians have gone so far as to maintain that they constitute a morbid entity with its own bacillus, but this has not yet been universally accepted; the general consensus of opinion being at the present time that any infective process giving rise to a general toxæmia, may so influence the joint structures as to produce the features of rheumatoid arthritis. Bannatyne,[1] however, holds that the acute infective process, be it due to rheumatism, gonorrhœa, or any other agency, is only primarily in evidence, and that very soon it gives way as it were to the specific micro-organism of rheumatoid arthritis. Nevertheless, it is a well-recognised fact that many infective processes attacking the articular structures, either directly or by means of their toxins, produce changes in them which clinically cannot be distinguished from each other, and the damaged joints ultimately present the typical appearances of rheumatoid arthritis. It therefore seems desirable that we should view the subject in a manner somewhat similar to that suggested by the late Sir James Paget, when in the Morton Lecture to the Royal College of Surgeons in 1887 he said: "It is better at present to think of diseases as in groups with borders that are not clearly marked; or as of nations with ill-defined frontiers and with inhabitants intermingling and ever intermarrying." Nowhere, perhaps, is this more applicable than in the chronic polyarticular affections seen in such numbers at mineral water spas like Bath. Necessarily they claim our attention, and we have made use of the X-rays hoping thereby to obtain some assistance in elucidating the changes which have occurred in the large variety of cases classed together as rheumatoid arthritis at the Royal Mineral Water Hospital, Bath, and we have to tender our thanks to Dr. Bannatyne for allowing us to do so.

In studying the cases of acute polyarticular arthritis, it will be found that many infective processes, *e.g.*, gonorrhœa, rectal ulceration, otitis media, etc., are capable of producing the characteristic features, and clinically they are referred to as being acute rheumatoid arthritis. In all these cases, whatever the cause may be, we have failed to obtain any evidence of any change in the configuration of the bony parts of the joints involved. If it be the proximal inter-phalangeal joint of the middle or ring finger we are examining, and this is a joint frequently affected, we get a lighter shadow representing the soft structures, giving a distinct picture of the spindle-shaped swelling surrounding the joint, but the ends of the phalanges themselves on either side of the joint appear normal. This was well demonstrated in the following case:—

CASE 1.—W. P., æt. 27—*Case of gonorrhœal arthritis not to be differentiated clinically from acute rheumatoid arthritis*—complained of stiffness and pain on movement in proximal inter-phalangeal joints, which presented the usual fusiform swelling; with similar stiffness, swelling, and pain in both knees, ankles, and temporo-maxillary joints. He also has double flat-foot. Onset six months ago in left hip, the knee on that side becoming affected a few days later, while two weeks later the ankles and fingers became affected. At the time of the onset

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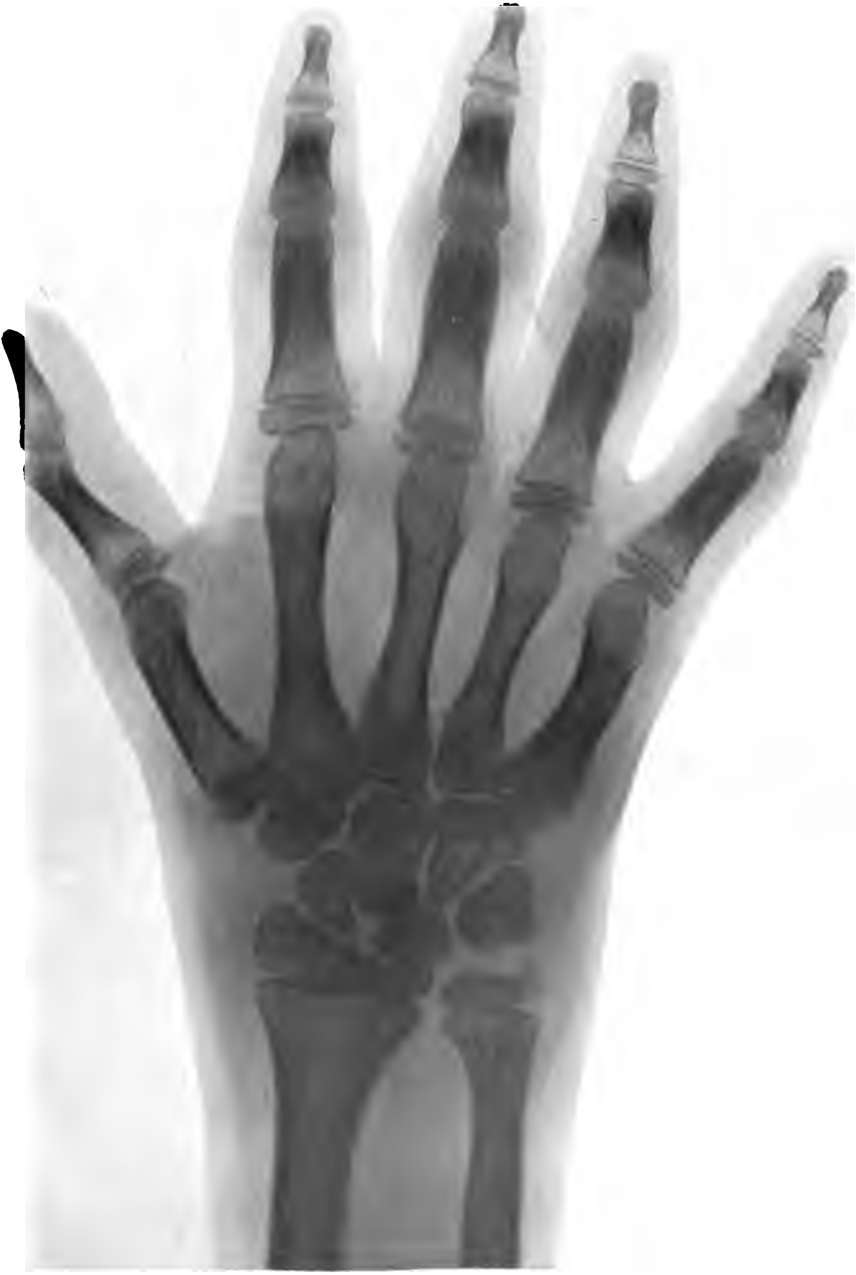
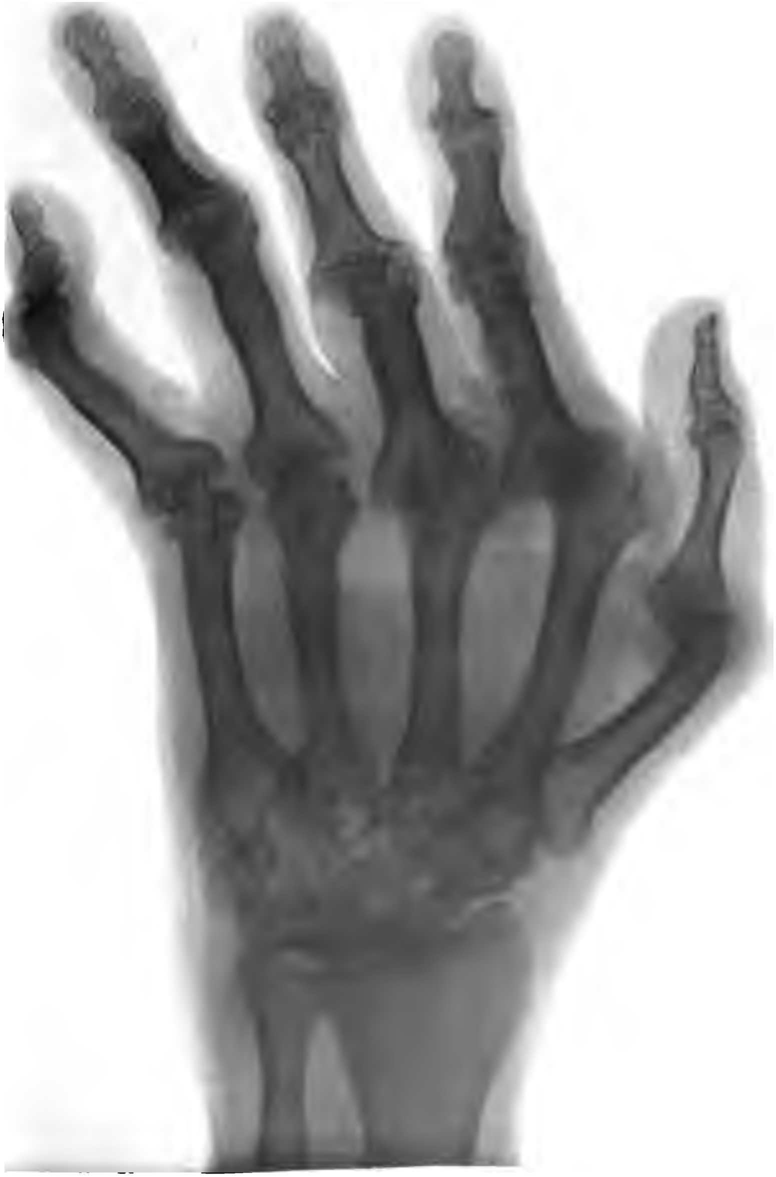
[1] "Rheumatoid Arthritis," p. 14.





the patient had a gonorrhœal discharge which had been going on for four weeks; he also had recurrence of discharge a few weeks ago.

In some instances we obtained in acute cases in young children the appearance of a cloudy halo in the lighter shadow of the soft parts surrounding the affected joint. In addition also to the above, although there was no change in the bony configuration, there was to be made out a lighter appearance of the heads of the bones. So that there seemed as if a chemical change had taken place in the constitution of the bony tissue,—a removal of the lime salts and consequently softening. This is well seen in Plate V., and the following are a few notes of the case:—

CASE 2.—W. F., æt. 10—*Well-marked case of acute rheumatoid arthritis*—Onset in metatarso-phalangeal joint of big toe of right foot a year ago. Further invasion of joints not remembered. He complained of stiffness and pain on movement in practically all the joints. Knees fixed and drawn up. Fingers and toes presented usual spindle-shaped condition.

When we pass to the cases of greater chronicity, we then find more definite signs of the bony structures becoming involved, and, generally speaking, these changes are commensurate with the chronicity of the case.

When erosion of the articular cartilage has occurred, it is always accompanied by considerable peri-articular swelling, giving a doughy or pulpy feeling to the joint, and the resulting stiffness, always marked on attempting to flex the fingers, is doubtless due to peri-articular fibrous ankylosis. Up to this stage no bony deformity has occurred, but the disappearance of the cartilage allows of a closer approximation of the ends of the phalanges, which caused the obliteration of the intervening space, always seen in the normal joint.

In cases that are further advanced we observe the deformity of the bones well marked, and along with it a twisting of the digits and ulnar deflection. The softened ends of the phalanges of the proximal inter-phalangeal joints are eroded, as also are the heads of the metacarpals and the carpal bones. Even now there is, however, no real bony ankylosis, and free movements of the affected joints may be obtained within a small arc, but the movement is quickly caught up by the bony overlapping.

When we view the most advanced cases, and these are what Goldthwait[1] has described as atrophic arthritis, we then find a more decided distortion of the bony structures. The proximal inter-phalangeal joints themselves show advanced destruction, together with atrophy of the shafts of the phalanges (Plate VI.). Owing to pressure of the head of the metacarpal upon the softened extremity of the proximal phalanx, a cupping takes place and the phalanx becomes characteristically trumpet-shaped in appearance, or, as Goldthwait explains it, the head of the metacarpal becomes telescoped into the end of the phalanx.

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[1] *Boston Med. and S. Journ.*, 1904, November 17.

These destructive changes having taken place in the bones, no hope can be held out of any recovery being brought about, even to a small degree, of usefulness, and bony ankylosis frequently supervenes when such a metamorphosis has once occurred in the articular structures. The peculiar trumpet-shaped appearance of the proximal phalanx we believe to be pathognomonic of chronic rheumatoid arthritis.

HYDROTHERAPHY AND ELECTRICITY IN THE TREATMENT OF NEURASTHENIA.

By G. L. Kerr Pringle, M.D. (Edin.), *Harrogate.*

Every practitioner at times is in despair as to suitable treatment for some particular case belonging to those groups of cases which, for want of a better name, are termed neurasthenia, hysteria, neuromimesis, or psychothenia,—a condition of disease which is decidedly on the increase, the increase being most apparent among the more advanced types of civilisation. The condition has been well described by Drummond of Newcastle as "like a person living always in one room with the blinds down, self-centred and miserable." Drummond[1] likewise points out that the causes leading to this distressing condition are always of a narrowing nature; people do not become neurotics by hard-working devotion to large and generous ideals, but personal business worries with men, and, in the case of women, domestic worries and petty annoyances, account for a large number of these troublesome cases.

The value of rest, isolation, and forced feeding, according to the methods laid down by Weir-Mitchell in American and W. S. Playfair in this country, are well known to the profession, more especially in those thin, anæmic, and nervous women, who have been treated for many ills in turn, and who notwithstanding continue miserable and unhappy, self-centred, and no better.

We have all seen the results of this excellent method of treatment, where a thin, emaciated young woman, who has been unable to retain any nourishment for weeks, in the course of a few days after treatment is able to eat one of the large meals prescribed, enjoy it, and, what is more important, retain it.

There is a certain percentage of cases, however, in which the Weir-Mitchell method of treatment is not suitable, or where it has failed. Among these may be mentioned cases approaching melancholia, especially in elderly people, and some of those difficult cases which are on the borderland between sanity and insanity.

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[1] *Brit. Med. Journ.*, London, 1906, July 7.

A case of the former type came under my care a few months ago, with the following history:—

CASE.—An elderly gentleman, who had previously suffered from attacks of depression and hypochondria, was placed by his medical attendant under the Weir-Mitchell treatment, with the result that at the end of a week or so he one night took the opportunity, during the nurse's absence from the room, to put on his overcoat, and, after carefully buttoning it up at the neck, got out of the window, and fell a distance of 18 to 20 ft. He had no intention of committing suicide, but simply this isolation in bed had so preyed on his mind that he was determined to get away from it all. Weeks elapsed amid fresh surroundings in Harrogate, where he had been sent at the suggestion of a well-known alienist, before he began to improve, as the original condition was very much aggravated by the fear in the patient's own mind that he must be insane to have committed such a deed.

Again, there is always a certain percentage of cases which relapse and return to the condition in a mild form,—for these the long period of rest and isolation a second time is unnecessary.

Medical men are also often at a loss to know what to do with their "rest-cure cases" at the end of a cure, for it is not advisable that they should return at once to their former duties or round of gaiety. In all such conditions hydropathy and electricity are decidedly beneficial. Before discussing these methods of treatment, it is well to take into account the part that suggestion, both "auto" and "hetro," plays in the treatment of these cases. If we can establish that necessary control over our patients which will enable them to have full confidence that such and such treatment will do much to assist them to a return to health, a great deal has been accomplished. Our tact will require to be exerted to the uttermost to enable us to do this, so that patients will place themselves unreservedly in our hands, relying that our treatment will get them better. Having once accomplished this, the battle is practically won, though an injudicious remark, or an answer which is not absolutely assuring, may undo a month's progress. We must remember that the potency of the will over the bodily sensations is beyond dispute, and that it must always be looked upon as of valuable assistance in the treatment of disease.

We hear much nowadays of the wonderful cures by means of "Christian Science," by "faith-healing," etc; but is there anything new in these? Are they not identical with the faith in the "Pool of Bethesda," of the Springs of Lourdes, etc.? Is it not the *Vis medicatrix Naturæ* of the ancients, or the "unconscious mind" of the twentieth century, dressed up in Yankee garments, which appeals to a modern craving for something tangible and new? We all recognise that there is something inherent in our patients, independent of the actual disease, which we take into consideration when giving a prognosis or in suggesting an operation. (It is here that the family doctor sometimes has the advantage over the consultant, by knowing what the patient calls his "constitution.") We say he has plenty of "spirit," "determination," he has the "will power" to get better, and so on. Mitchell Bruce says that "we are compelled to acknowledge a power of natural recovery inherent in the body."[1] What we as physicians have to do, then, is to assist the body in making use of this power, which, I take it, may be the action of the unconscious mind.

Now, hydrotherapeutic treatment can only be carried out satisfactorily at a spa, though a great deal may be accomplished at home by a judicious use of salt-water bathing at various temperatures, along with massage. The very fact that a patient is coming to a spa like Harrogate to be cured creates a ray of hope in his or her mind, which fact must not be lost sight of. It is the duty of the physician in attendance to enlarge that ray by every legitimate means, so that at the end of a month or six weeks the cure will have become a reality, by the building up of the general bodily health, and improvement in the condition of the blood.

It will be well, before going further, to differentiate between the various forms of neurasthenia which are benefited by spa treatment. They may be divided into three groups. Those dependent on—(1) Toxic states, either "auto" or "hetro" toxation; (2) fatigue, either from business worries or home personal worries, a group dependent probably on group 1; (3) shock, either mental or physical, which group of cases is more likely dependent on an hereditary unstable nervous system.

Group 1 contains the majority of cases, and there is always present some form of digestive disturbance. It may be either gastric or intestinal in type, usually the whole alimentary tract taking part in the general fatigue of the body, accompanied with the usual symptoms of flatulence, constipation, and perhaps the passage of mucous shreds, all of which in time produce a gradual auto-toxation, and the defective assimilation by assisting in keeping up the condition, produces a vicious cycle. The majority of the cases in group 1 will be greatly assisted by a course of the Harrogate sulphur waters, effecting as they do a thorough washing out of the whole alimentary canal, and thus getting rid of the constipation and the toxic materials from the blood. If the patient is not in a fit state to drink the sulphur waters, very great assistance may be obtained from the Plombières bath, which has been recently introduced at Harrogate, and which has already met with considerable favoúr in the treatment of habitual constipation, muco-membranous entro-colitis, and dilatation of the colon. This method of treatment consists of an intestinal lavage followed by a submassive douche. The complete séance is as follows:—The lower bowel is washed out by means of a hydrostatic douche connected with a soft rectal tube, the pressure, temperature, amount and variety of the mineral water employed being at the discretion of the medical attendant. Usually two separate injections of from 20 to 60 oz. or more are employed. Subsequently the patient is placed in an ordinary immersion bath, the temperature of which is kept at about body heat. Beneath the surface of the water is a flexible pipe terminating in a finely perforated rose, through which a hot douche at any required temperature can be played over the abdomen. The general condition of the patient is later on toned up by the various forms of thermo-mechanical baths, such as the needle, Harrogate douche, Aix or Vichy massage douche, by which the functional activity of the vasomotor fibres is stimulated, and the blood pressure raised or lowered according to the variety of the bath employed. The patient is enjoined to rest as much as possible, the greater portion of the day being spent if possible in the open air. The close proximity of Harrogate to the Yorkshire moors gives to the air a characteristic freshness, and as the patients gradually improve, they are enabled to enjoy more and more of it, sitting out in a bath-chair in some secluded and sheltered spot among the pines on the Harlow moor. Harrogate has unfortunately a reputation in some quarters for being a cold place, but when Harrogate is spoken of, it must be remembered that there are two distinct climates. That portion round the baths and wells, known as Low Harrogate, has a much higher temperature than at High Harrogate or Harlow Hill. It is important that medical men in sending their cases should remember this point. In the group of cases dependent on fatigue of the nervous system, due to some long trial either mental or physical, a debilitating illness, such as influenza, the tonic waters of Harrogate, such as the Chloride of Iron, Kissingen, or Mild "Chalybeate," are prescribed. Frequently the heart in these cases gives considerable trouble; sharing in the general fatigue, it gives rise to symptoms of faintness and palpitation. The Nauheim and Schwalbach baths may be employed here with marked success. In the third group of cases which are ascribed to shock, the nervous system must be soothed. This is accomplished by means of hot sulphur immersion baths, peat or mud baths, and at the same time the general condition of the alimentary canal must not be overlooked. As improvement takes place, the baths may be of a more stimulating variety, till at length the patient is able to take the full benefit of the Aix or Vichy massage douche.

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[1] *Practitioner*, London, vol. xxxiv. p. 241.

Along with the above various methods of hydropathy, neurasthenics may obtain considerable benefit from the various forms of electricity. It is, however, extremely difficult to judge its effects in these cases, more especially when "high frequency" and "static electricity" are the methods employed. This is most probably because both these methods have a decided psychic effect on the patient, and in addition the patient is usually having some other form of treatment. According to most observers, the results with high frequency are very unequal. There are a variety of cases which might be termed as mild or incipient, in which there is some local symptom present, such as an intractable neuralgia, a neuritis, a paralysis of certain muscles, or a local area of hyperæsthesia or anæsthesia, which have defied the usual methods of treatment. It is in these cases that improvement takes place both from "high frequency" and "static electricity." An intractable neuritis which may or may not have a rheumatic or gouty origin, but which has become neurotic through course of time, will eventually clear up by these methods. In combination with other forms of treatment, we must look on "high frequency" and "static electricity" as a very useful addition to the armament of the physician in the treatment of this condition.

As regards such symptoms as sleeplessness, etc., we at once come back to the crux of the disease, namely, that it is essentially a disease of the mind, and that systematic treatment in these cases must not be indulged in, but where necessary such symptoms as sleeplessness, etc., must all be individually treated, and above all the varied temperaments taken into account. Moreover, while the body is being attended to, the mind of the patient must be fully interested, so that the continuous apprehensions and daily introspections of the patient may become fewer and fewer. The patient should be encouraged to take up some novel intellectual exercise, for a certain time every day. It may be simply playing "patience" reading a book which requires thought, the study of a language or one of the sciences, so that at least during some portion of the day their thoughts are taken up outside themselves.

Finally, in sending a patient to a spa for treatment of this condition, they should not be sent to one of the big hotels or hydropathic establishments, but to some bright and cheerful apartments.

In writing these pages, I cannot claim that there is anything fresh in the spa treatment of neurasthenia, or that a routine course of hydrotherapeutics will cure all cases of this disease; such an idea would savour of quackery, which is the last impression I should like to be formed. Anything, however, we can legitimately and intelligently do to restore these cases to the normal is worthy of consideration, so that we may prevent these poor creatures from falling into the hands of quacks, Christian scientists, faith-healers, etc., which they will assuredly do if medical men do not use every means to assist them to return to a normal state of health, and thus enable them to take their place in the world as ordinary human beings.

RÉSUMÉ OF SOME RECENT PAPERS ON THE ULTIMATE RESULTS OF OPERATIONS FOR CANCER OF THE BREAST.

By ALEXANDER MILES, F.R.C.S.Ed., *Assistant-Surgeon, Edinburgh Royal Infirmary.*

THERE is great difficulty in obtaining reliable statistics regarding the ultimate results of operations for the radical cure of mammary cancer, and of estimating the real value of different operative procedures from such statistical evidence as is available. There is probably no operation performed with equal frequency regarding the final results of which the surgeon can predict so little. Often in the simplest and most hopeful cases recurrence takes place within a few weeks or months of the operation, while in those where success seems beyond hope, the patient remains permanently free from disease; and no satisfactory explanation of such variation is forthcoming.

In a series of papers[1] recently read before the American Surgical Association, various American surgeons have recorded their experience, and, while it must be confessed that our difficulties have not been removed by a purusal of these, some valuable light has been thrown on the matter. Within recent years the tendency has been to extend the field of operation further and further beyond the apparent seat of the disease. The practicable limit must soon be reached, and the question has been asked—Are the results improving *pari passu* with what is called the "completeness" of the operation? Before we can estimate the results, we must decide what is to be regarded as a "cure" of cancer of the breast. It is now abundantly evident that the standard set by Volkmann, a quarter of a century ago—immunity from recurrence three years after operation—is not sufficiently rigid. Ransohoff draws attention to the results of certain published investigations which show that "of those who have safely passed the three-year limit about 20 per cent. succumb later to recurrence *in loco*, or to visceral, bone, or gland metastases." The same writer reports thirty-seven cases of recurrence after six years, including what he believes to be the longest-delayed case of recurrence on record—one in which the disease reappeared nearly twenty-one years after operation. Greenough and his colleagues at the Massachusetts General Hospital report seventeen out of eighty-eight cases (19 per cent.) in which recurrence took place beyond the three-year limit, and in four of these it was more than six years from the operation. In cases in which the supraclavicular glands have been implicated (and removed at the operation), Halsted would be sceptical of "cure" unless the patient lived five years after operation, and even then he would not promise immunity.

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[1] *Ann. Surg.*, Phila., 1907, July.

The writers are agreed that one of the most important factors in determining the prognosis is the *type of cancer* present, the richly cellular, rapidly growing, soft carcinomata being much less amenable to complete removal, even when seen early, than the more fibrous, slowly growing, hard varieties (Oliver). "Medullary carcinoma is more grave than that of the scirrhous type, and adeno-carcinoma and colloid are relatively of a far less malignant type" (Greenough). N. Jacobson goes so far as to say that "there is as much difference in the virulence of cases of carcinoma as there is in acute infectious fevers," and that "acute cases can be of scirrhous as well as medullary character. In this class . . . the virulence of the infection renders a permanent cure impossible."

The extent of the *glandular involvement* is also to be recognised as an important factor in prognosis. When the axilla is free of palpable glands, the risk of recurrence is less (two out of three being cured), and metastasis, if it occurs, is later. Thus 70 per cent. of Halsted's cases with undemonstrated glandular involvement are tabulated as cured. On the other hand, in 23·4 per cent. of cases "with microscopically negative axilla," death from metastasis took place. In Greenough's experience, when no glands have been palpable, 29 per cent. were successful; while when the axillary glands could be felt, in only 12 per cent. was there freedom from recurrence.

Halsted has twice seen extensive carcinomatous involvement of the axilla due to mammary cancer, a considerable time before the disease in the breast became demonstrable.

Implication of the supraclavicular glands adds greatly to the gravity of the prognosis. In Greenough's series of 376 cases the supraclavicular glands were involved in forty instances, of which only two survive, and those were cases in which the enlarged glands were removed and found not to be cancerous on microscopical examination. Pilcher has found, however, that in ten of his cases in which enlarged supraclavicular glands were discovered and removed, three remained free of recurrence. Halsted's estimate of the gravity of this complication has already been referred to.

Oliver reports some observations regarding the *duration* of the disease before operation in relation to the prognosis. Of thirty-five patients, twenty-one had known of the existence of a tumour in the breast for one year or longer; fifteen had recurrence, and six survived the three-year limit without recurrence. In eight cases the patient knew of the tumour for between six and twelve months; four died, and four were cured. Six had been aware of the growth for less than six months; four died, and two were cured.

As might be expected, the existence of *ulceration* is unfavourable. "Of thirty-one ulcerated breast cancers Wunderli reports only two living after three years" (Ransohoff). "Of sixty cases in which the tumours had progressed to ulceration, 6·6 per cent. recoveries took place; while of 316 cases in which no ulceration was present, 21 per cent. were free of later recurrence" (Greenough).

Few recoveries are reported when the disease involved *both breasts*. Oliver records two cases in which the patients were alive and well, seven and a half and five and a half years respectively, after the operation in the second breast. Greenough had six cases, all fatal; and Ransohoff two cases, one of which was cured.

The only reference to *cancer in the male breast* in this series of papers is made by N. Jacobson, who had three cases, all ending fatally by recurrence.

When these various factors have been taken into account in prognosis, there still remains the question as to whether or not the extensive modern operations have improved the results. Were we to rely upon figures alone for an answer, it must be admitted that the evidence here before us would not prove encouraging. In the series of 376 cases reported from the Massachusetts General Hospital, for example, "complete" operations were performed in 160 cases, with 16 per cent. of successes; "semi-complete"—*i.e.* the pectoralis minor not disturbed—in seventy-five instances, with 25·3 per cent. successful; and "incomplete" in eighty-five cases, with 25·9 per cent. of successes. Palliative operations were performed in fifty-six cases, and in four of these the patient remained free from recurrence. After considering all the side issues, and allowing for complications, the authors' summary on this point seems to us to be fair. They say, "Extensive operations with wide removal of skin gave the greatest freedom from local recurrence. Removal of the pectoralis minor appeared to be of slight significance. Incomplete operations on early cases yielded better results than extensive operations in cases which were well advanced."

Cabot's results show nine, out of forty-two cases, free from recurrence; in seven of these the breast and axillary contents were removed, and in two the pectorals were also removed. In five cases still alive, with recurrence, the muscles were removed with the breast and axillary contents. Of the twenty-eight fatal cases, the muscles were removed in twelve and were left in sixteen. This author attaches more importance in prognosis to the extent of lymphatic involvement than to any other factor.

In Oliver's series both pectorals were removed in thirty cases, with ten cures; in seven they were not removed, and four were cured.

Halsted, whose views as to the dissemination of carcinoma of the breast "accord fully with Handley's," advocates very extensive operations. "We must remove," he says, "not only a very large amount of skin and a much larger area of subcutaneous fat and fascia, but also strip the sheaths from the upper part of the rectus, the serratus magnus, the subscapularis, and at times from parts of the latissimus dorsi and the teres major. Both pectoral muscles are, of course, removed." He considers an attempt to close the breast wound by a plastic method as dangerous, and "to be vigorously discountenanced." The gap left after removing a large area of skin should be covered by skin grafts.

The practice of different surgeons seems to vary with regard to the systematic routine removal of supraclavicular glands. Halsted, for example, for the past two years has performed "the neck operation" in most cases. He recommends it, barring special contra-indications—(1) In all cases with palpable, operable neck involvement; (2) when the apex of the surgical axilla is involved; and (3) even when the mid-axillary glands are implicated. Pilcher follows the practice of Halsted in this particular. Greenough and his colleagues removed the supraclavicular glands in twenty-six out of 160 cases, but in only one case was the operation a success in preventing recurrence. N. Jacobson only removes the glands when they are palpably involved. There seems to be good reason to believe that the disease is frequently disseminated by the manipulations involved in the operation, and that this danger increases in proportion to the severity of the operation. Ransohoff, for instance, is of opinion that inoculation of the wound is a danger of the modern operation, and he believes that he has "seen relatively more cancers *en cuirasse* follow speedily after the radical than the older methods of operation." Halsted has found that exploratory and partial operations seem to encourage dissemination. He recommends that in cases in which there is risk of this, the actual cautery should be used, or the raw surface cauterised with carbolic acid. Greenough and Cabot are also alive to this danger. To diminish the risk of dissemination, it is advisable to clear the axillary space and the other lymphatic areas before dealing with the central tumour, and to avoid pressing or crushing the growth or the lymphatics leaving it. As far as possible the whole of the diseased tissue should be removed *en masse.*

Ochsner, Cabot, Ransohoff all favour the plan of treating the patient by X-rays, after operation, with a view to preventing recurrence by destroying any portions of the cancer that may have escaped removal. Exposures are made twice a week for three or four months after operation. In cases in which recurrence has already taken place, the X-rays appear to have checked the growth of the cancer and delayed its spread.

According to Ransohoff, the great majority of recurrences take place in the scar or in the skin in its immediate vicinity. Greenough, on the other hand, found that recurrence in the scar occurred in less than one-half of the cases. Greenough's figures show that a certain amount of swelling of the arm or hand is not necessarily a sign of recurrence of the disease. Halsted mentions that he has twice observed disseminated pains, so severe and so located as to suggest cancerous involvement of the vertebræ, disappear after removal of the growth. The pains he believes were due to the toxines generated in the course of the growth of the cancer.

A STATISTICAL STUDY OF INSANITY.

"A MAD world, my masters." Yet the world wags along contentedly enough, careless of its madness, and only when some Jeremiah proclaims it not merely mad, but yearly growing madder, does it pause uneasily to ask whether this can be,—whether we are more fools than our fathers were, and whether our children will be more fools than we. Is it true that an actual increase of insanity is proved by the facts of the case; that the insane under restraint are surrounded by a constantly growing fringe of borderland cases? Shall we range ourselves by the side of a recent correspondent to the *Times* in affirming both these propositions, and disparage, with him, "the many estimable people who like to amuse themselves with hypotheses, while they close their mind to unpleasant facts, and urge that the constantly growing number of the permanent inmates of lunatic asylums does not indicate any actual increase of the diseases for which seclusion is enforced." Is it true, as he says, that the effect of the mere sweeping up and incarceration of the harmless so-called "naturals" of country villages was exhausted within a few years of the passing of the Lunacy Acts of 1845; that in 1844 the insane were in the proportion of 1320 to the million of the population, while in 1906 the ratio had risen to 3531? The problem is too important to theorise about: we ask for facts. Let us banish impressions and preconceived ideas, let us even be chary at not drawing our own inferences from figures, and ask the expert statistician to deal with them—and in Mr. Noel Humphreys' admirably lucid and exhaustive paper[1] we find reason to trust that things are not so bad as has been made out,—that though we may be mad, we at least may hope we are not yearly growing madder.

When it is baldly stated that by official computation the number of lunatics in England and Wales has increased in sixty-two years from 0·132 per cent. to 0·353 per cent. of the population, there seems, *primâ facia*, some reason for supposing that insanity as a disease is becoming more prevalent, but on scrutinising the figures more carefully we see that this conclusion is at least premature. For Mr. Humphreys points out that the figures for 1844 were admittedly imperfect. Based on a report of the Metropolitan Commissioners to the Lord Chancellor, they did not include the large class of insane persons without certificate; even the returns concerning those private cases under certificate were very incomplete. Valuable as the return in question may have been for its purpose, Mr. Humphreys regards any comparison between it and recent figures issued by the Lunacy Commissioners as answering no useful purpose in proving or disproving the alleged increase of insanity.

It is common knowledge that only a certain proportion of the mentally unsound come within the purview of the Commissioners of Lunacy, and this reserve of uncertified cases is a constant and variable source of error in attempts to estimate the prevalence of mental disease. The reports of the last four census enumerations, however, throw much light upon the varying number of this reserve. The first census in which mental defect was scheduled was that of 1871, all forms being grouped together as lunacy, idiocy, and imbecility, and the result was a return of 39,567 lunatics and 29,452 idiots or imbeciles. In 1881 and 1891, in answer to the same question, the total given rose first to 84,503, and then to 97,383; the proportions in the three census years being 3039, 3253, and 3358 per million respectively. In the reports on the censuses, the opinion was expressed that the figures were probably understated, but that a nearer approximation to the true number was returned at each successive enumeration. In 1901 a change was made in the schedule, whereby the term "idiot" was replaced by "feeble-minded," and in that year there was a very large increase (up to 132,564, or 4078 per million) in the return of mental unsoundness. Mr. Humphreys draws the natural inference that this rise was due to the altered nomenclature having widened the sweep of the net; the return is probably more accurate, but has lost its value for comparison with previous censuses. The figures prove conclusively, however, that there has always existed, and that there still exists, a large reserve of mental unsoundness in excess of the constantly increasing number of the certified insane.

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[1] "The Alleged Increase of Insanity," *Jour. Roy. Statis. Soc.*, 1907, June 29.

From this reserve of uncertified mentally unsound persons the numbers of the certified are constantly being recruited, and the very important question arises whether cases are now being certified which would formerly have escaped. Mr. Humphreys has compared the aggregate census numbers of insane persons with the numbers reported to the Lunacy Commissioners, and shows that the deficiency in the Lunacy Commissioners' numbers fell in 1871, 1881, and 1891, the percentages of deficiency being 17·8, 13·5, and 10·9; in 1901 the deficiency rose to 18·6 per cent.—presumably from the alteration in the form of question put. So far as they go, however, the figures suggest that year by year a larger proportion of all cases of insanity are certified under the Lunacy Acts. A further analysis of the census returns shows that beyond disclosing the existence of a large reserve of cases of mental unsoundness, they neither afford trustworthy evidence of the actual amount of insanity existing, nor of its increasing or decreasing prevalence in the community.

When we turn to the Lunacy Commissioners' statistics for an answer to our inquiry, we find that the certified insane have constantly increased in proportion to the population, but that the rate of increment has been a diminishing one. During the quinquennium 1859–63 the ratio was 1972 per million; in 1879–83, 2811; in 1899–1903, 3336. Here again, however, the bare figures require qualification. The percentage increase from 1859 to 1903 was 77·8, but when we compare percentage increases for successive quinquennia it is found that the figures decline. Thus it was 12·9 as between 1859–63 and 1864–68, while it fell to 2·4 as between 1884–88 and 1889–93. True, it has since risen to 5, but the increase, though constant, has not been progressive—its rate has fallen. Though the total proportion has risen, the tide of increase flows less strongly than at first. Again, until recently there has been no material for differentiating between first admissions and readmissions—no means, that is, of reaching any decision as to the number of fresh cases. Statistics on this point are only available for eight years, and what do we find? In 1898 the first admissions bore a ratio to the population of 492 per million; it rose steadily to 576 in 1902; it has as steadily declined to 521 in 1905. And, moreover, if, as is probable, a number of these first admissions are persons of unsound mind residing in workhouses or at home, the first admissions to asylums overstate the annual number of newly occurring cases of insanity.

Much more important, however, than the declining rate of increase, and the absolute fall in the ratios of first admissions to the population, is what is known as the "accumulation of the insane." Those who assert that mental disease is really on the up grade derive their sole support from the increased proportion, relatively to the population, of insane persons under the cognisance of the Commissioners. Now, obviously the books of the Commissioners may show more patients from year to year either (*a*) from an increase of new entries, or (*b*) from a decrease in the names removed. When fewer names are removed, the cases accumulate; names are removed either by death or recovery, hence a diminished death rate or a diminished recovery rate means accumulation—means a larger proportion of the insane. As Dr. Farr put it, "There may be ten times as many lunatics in civilised as in barbarous countries and times; not because the tendency to insanity is greater, but because the lunatics live ten times as many months or years." Now the mortality rate in asylums has naturally shown a downward trend. In round numbers, it varied during the period 1859 to 1878 between 10·1 and 10·4 per cent. of the average annual number of patients; since 1879 it has sunk as low as 9·4 per cent., and has only once been so high as 10 per cent. In other words, had the death rate of 1859–68 prevailed during the decennium 1889–98, the asylum population would have been fewer by 4605 inmates.

Accumulation due to a lessened mortality may be a bane, but at least carries its own antidote; it is less easy to find consolation for the other cause of accumulation—the continuous decline of "discharges on recovery." It may be due, it is true, to unwillingness of relations to assume the care of harmless insane, but, be that as it may, to the medical man this failure of his art is the one drop of bitter in Mr. Humphreys' paper. Yet the circumstance that he cannot increase the number of patients discharged as recovered is a more influential factor in producing accumulation in asylums, than the fact that he has succeeded in prolonging their lives. The "discharge on recovery rate" averaged 115·4 per 1000 during 1873–77; declined to 92·5 per 1000 in 1898–1902, and still further fell to 88 per 1000 in 1903–05. To show how effective accumulation is in raising the number of asylum inmates, Mr. Humphreys calculates that, had the total discharge rate of 1873–77 prevailed during 1903–05, the number of asylum inmates would have been reduced by 8814 in the three years. Thus, instead of the recorded increase of 7236 in the number of patients during these three years, there would have been an actual decline of 1578 had the earlier discharge rate been maintained. This is one of the most remarkable circumstances brought out by these statistics; it strips the phrase "sepulchres of the intellectually dead" of some of its rhetoric, and clothes it with hard fact.

A further proof that accumulation is an important factor in raising the total insane population is furnished by a study of the age distribution of asylum patients. Ever since 1851 there has been a steady rise in the number of old patients, and an equivalent fall in the number of younger ones. Of 1000 inmates of asylums in 1851, there were 549 aged under 45 years, and 451 above that age; in 1904 the younger patients had declined to 480, the older risen to 520. Unless it can be proved that insanity now attacks persons at a later age than formerly, it is impossible to doubt that the preponderance of insane patients in asylums at advanced ages is mainly the result of accumulation.

Besides accumulation, another very potent factor in increasing the insane population of asylums is the growing tendency to transfer cases of senile decay, harmless aged dements, and such, from workhouses to institutions. Taking admissions to asylums from workhouses as a whole, a very large proportion (1141 out of 1455) was of persons above 70 years. The Asylums Committee of the London County Council have expressed the opinion that "the certification of old people is a very important factor in the recorded increase of lunacy," and that "the great majority of old people who are received in asylums are in such a condition that it is possible to certify them as not of sound mind; but at the same time it is right to point out that in many instances this condition is the consequence only of natural decay through advance of years, and in many cases it is their physical rather than their mental condition which calls for most attention. This circumstance may explain why Boards of Guardians are so ready to send old persons who become troublesome in their infirmaries to asylums." Another cause operating in the same way is the statutory grant of 4s. per week for pauper lunatics in asylums, which has much accelerated the transfer of harmless chronic imbeciles and lunatics not requiring the expensive treatment provided in asylums. In London each pauper so transferred saves the local ratepayer about £15 per annum—no small inducement to a Board of Guardians. But though individual unions save by the transfer, the financial burden of London as a whole is made heavier, for the average annual cost of an insane pauper is from £42 to £44, while that of a pauper in a workhouse does not exceed £35. If a broader-minded, less parochial spirit of economy prevailed, there is thus reason to suppose that the public burden would be less, and the asylum inmates fewer.

The results of Mr. Humphreys' inquiry, therefore, discredit the prevalent assumption that insanity is on the increase among us. We have seen reason to suppose that the standard of mental unsoundness calling for certification has altered, and that cases are now registered which would not have been so certified half a century ago. Again, there is a large reserve of borderland cases, but, as the census returns compared with the Lunacy Commissioners' statistics show, this reserve is probably declining at the expense of a rising number of certified insane. People are now undoubtedly either more convinced of the advantage of asylum treatment, or less ready to incur the risks and discomfort of keeping mentally affected relatives at home—in any case they send them in larger proportions to asylums. Here, then, is one great set of causes operating to produce an apparent increase of insanity. At the other end we have the accumulation of lunatics, as evidenced by the altering age distribution, the falling death rate, and the diminution of discharges on recovery. Finally, there is the tendency to certify, on financial grounds, simple cases of senile dementia for treatment in asylums. It is Mr. Humphreys' "decided opinion that there is no absolute proof of actual increase of occurring insanity in England and Wales"; on the contrary, he believes that the "increase of the registered and certified insane is not really the result of increased prevalence of insanity." Our confidence in the correctness of Mr. Humphreys' opinion is fortified by the fact that in the discussion on his paper by statistical and medical experts, practically no destructive criticism was offered, while a very general agreement with the cogency of his reasoning was expressed.

J. S. F.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

A System of Medicine. Edited by WILLIAM OSLER, M.D., assisted by THOMAS M'CRAE, M.D. Vol. I., "Evolution of Medicine," "Predisposition and Heredity," "Diseases caused by Physical, Chemical, and Organic Agents, by Protozoa, by Animal Parasites," "Nutrition," "Constitutional Diseases." Vol. II., "Infectious Diseases." London: Henry Frowde and Hodder & Stoughton.

WE have naturally awaited the first volumes of the new "System of Medicine," edited by one who is at least *primus inter pares* of the leaders of English medicine, with pleasurable anticipation, wondering how they would compare with the great Systems of the past,—with Reynolds, for instance, and with Ziemmsen, as well as their modern successors, Allbutt and Nothnagel. The present reviewer has always turned to the last two of these as authorities on which he could depend not to disappoint him, and he approached Dr. Osler's new "System" with these as his standard. In saying that the new volumes range worthily alongside the others, a high tribute is therefore intended.

Of the articles in the first volume, four are of quite outstanding merit and interest,—the "Introduction," the article on "Heredity" by Professor Adami, Dr. Calkin's paper on "Protozoa," and the "Study of Metabolism" by Dr. Chittenden and Mendel. By way of introducing the "System," Dr. Osler sketches the "Evolution of Medicine" with a master's hand. Beginning as an age of wonder in which man gave an anthropomorphic answer to the riddle of life and death, as he did to the other mysteries and terrors which surrounded him, medicine evolved into a cult of divine healing which reached its apogee in the temples of Asklepeios. The Hellenic intellect applied the scientific method to the art of medicine, and conversely the early Greek physicians played no small rôle in imparting a critical spirit to Greek philosophy. One is tempted to wonder whether ever since in the world's history the doctor occupied so high a place as he did among the Greeks. In medicine, however, the history of other fields of knowledge repeats itself: Progress with Greek and Roman civilisation: petrifaction in the Middle Ages. We talk glibly of the Renaissance, yet who can realise what it meant? Most of us have actually witnessed medicine make an incomparably greater stride in half a generation than it did from the days of Galen to Harvey;—we think it a lean year indeed which does not bring a single discovery of note. It is therefore hard for us to imagine these fourteen sterile centuries, barren but for the trickle of learning which the Byzantine schools preserved. No Englishman, and still more no Scotsman, can read of the rise of modern medicine without feeling proud of his forebears. Harvey and Sydenham recall the science and art of the new medicine, while Boerhaave's pupil, the brilliant and versatile Pitcairne, if his light was dimmed by that of "the world's greatest physician," his master, yet founded a school which was to outrival Utrecht and Leyden. "Edinburgh," says Dr. Osler, "soon outstripped all compeers"; its influence on England and the Colonies "became supreme"; and with pardonable pride Dr. Osler traces the rise of M'Gill medical school to a group of young Edinburgh graduates who went to Canada in the thirties. We feel tempted to go on noting many topics of interest in this paper, but must be contented with one excerpt. Dr. Osler, while warning the student against "a cold Pyrrhonism, to which everything is doubtful," is yet more emphatic in inculcating a scientific distrust. "Credulity is of the very essence of human nature, and we physicians are not exempt from the common lot . . . Science has done much in revolutionising mankind, but man remains the credulous creature he has been in all ages. . . . It is an aspect of human nature we must accept and sometimes utilise," for "'he cures the greatest number in whom we have most faith.'"

Professor Adami clears the ground for a discussion of inheritance and disease, by dismissing the supposed results of maternal impressions and the specific infections from the realm of inherited diseases. For practical physicians the crucial question is, whether acquired variations are inherited, and Professor Adami draws a very clear distinction between the transmission of an acquired character in its narrow sense, and the transmission of a modification due to parental disease affecting the molecular constitution of the germ plasm. That this occurs is likely; variation is therefore not solely due to amphimixis. The work of Mendel and Karl Pearson is referred to, and Galton's law of inheritance is accepted as practically true enough for purposes of expression. Turning to theories of inheritance, a good account of Weissmann's views is given, and while full justice is done to them, the mechanical impossibility of their correctness on all details is pointed out. One is glad also to see that Adami states definitely that the germ plasm is only potentially eternal; constantly renewed, the germ cell lives immortal in its daughter cells only as a man is linked to immortality by his children. Adami presents a physicochemical theory of inheritance for our acceptance. The living molecule is conceived of as a central ring with side chains which constantly interact with their surroundings. Alterations in the environment produce variations in the molecule, and the longer such alterations operate the longer is it before their effects desist, until eventually the variations become stereotyped, and remain even after a return to the original environment. Thus, and through the effects of sexual conjugation, does each new individual vary from the ancestral type. The vital unit in each new individual's germ cells is not the same as the parental unit, but is the outcome of the growth of the new individual, and as it has been subject to the same environment as the new individual, so it has the same constitution. This conception, for which a certain amount of direct biological evidence exists, harmonises with what is known as to disease. There is inheritance neither of gross structural changes nor of infections, but only of acquired bodily conditions which affect the body tissues, and through them the germ cells; such aquired conditions are extrinsic or toxic, and intrinsic or metabolic. In the latter case the result is the acquirement and transmission of a diathesis.

Protozoal diseases now bulk so largely in medicine that a knowledge of the biology of the protozoa is essential. In the compass of ten pages Dr. Calkin gives a most lucid account of these organisms, dwelling on the fundamental fact of their alternating sexual and asexual life cycles. It is, of course, this alternation which so obscures the study of protozoal infections, since cycles which differ so greatly as to seem unrelated may produce equally dissimilar diseases. Following this comes a well-written and illustrated article on "Mosquitos" by Dr. Howard, and excellent papers on "Malaria" and "Blackwater Fever" by Dr. Amy and Dr. Stephen respectively. "Trypanosomiasis" is ably discussed by Colonel Bruce, the pioneer in this branch of medicine, who gives an interesting account of his discovery of *T. Brucei* in Zululand in 1894. In view of the recurring reports of "cures" of sleeping sickness, his statement that years must elapse before it can definitely be stated that any drug is "curative" in so protracted a disease, is salutary. We presume that the absence of reference to atoxyl is due to the fact that some time has elapsed since the paper left Dr. Bruce's hands, for we also note that he refers to Ehrlich's researches (now published) as being still in progress. "Zooparasitic Diseases," other than protozoal, are treated in a long contribution by Dr. Stiles, and this article would have benefited by a little revision, so far, at least, as its manner is concerned. Even if it were needful to tell us that "parasites, like other organisms, are subject to the law of evolution," to emphasise the fact by such a sentence as, "To assume that all parasites were created in the beginning as they exist today, would be to stamp Adam as a most remarkable helminthological museum," is neither seemly nor appropriate in a book of this description. Again, medical men may be pardoned if they violate the nomenclature of biologists, and we most willingly accept Dr. Stiles' dictum as to the superiority of the International Code. But one who is so meticulous as to call the *Bothriocephalus latus* the "dibothriocephalus" ought not to take such a liberty with the language as to employ "venal" when he means "venous,"—a usage we find in his pages, and for which we doubt whether there is any good authority. These criticisms, however, concern matters of taste, and the article is strong from the purely zoological standpoint. A more serious objection is that the clinical and therapeutic sections of the article do not bear that stamp of personal experience which is so marked a feature of the other contributions. Part 8 opens by an exhaustive article on "Metabolism" by Chittenden and Mendel. All important aspects of this complicated subject are referred to, and the article is really extremely well done. But to the physician not an expert on physiological chemistry, it is very hard reading, and we wish that the authors had here and there tried to summarise what is definitely proved. At present there is so much that is doubtful or contradictory, that where all is so hard of comprehension we should have liked Dr. Chittenden to dot the i's for us. We tested the article practically in this way: we took subjects on which we were personally interested, and sought light and leading from the author—delayed chloroform poisoning, for instance, was in our mind. We therefore read the various sections on acidosis, fat metabolism, and the like, with some care. We hope it is not sloth which made us wish that Dr. Chittenden had given us more aid in steering to what is of fundamental importance, and between the side issues. At present one must reluctantly admit that in studies of metabolism it is difficult to see the forest for the trees. Among the other articles in this volume we would single out for special praise Dr. Still's paper on "Rickets," and Dr. Edsall's contribution on "Diseases caused by Chemical Agents," which is really first-rate. Diseases due to Organic Agents, to Physical Agents, and to Non-bacterial Vegetable Parasites make up the rest of volume i.

We have space to refer only to the outstanding features of volume ii., which treats of infectious diseases, and is opened by a chapter on "Infection" by Hektoen. It covers a more extended field than Ritchie's well-known article on the same subject in Allbutt's "System," with which it inevitably challenges comparison, and one feels that more space might have been given to immunity, and particularly that a fuller discussion of the side chain theory would have rendered a difficult subject more readily comprehensible. Among the other features in the volume, "Typhoid Fever" and "Pneumonia" bulk conspicuously. The former has been entrusted to the assistant editor, and those who already know Dr. M'Crae's work on typhoid will agree that no better choice could have been made. The contribution extends to 160 pages, and is full of valuable information. The importance of water drinking in the treatment is emphasised. Drs. Musser and Wilton write on "Pneumonia," and looking for the moment only at the treatment, we find aëro-therapy given a high place. For the rest, the measures advocated are those in general use. The final advice, deprecating the use of X-rays, is sound; there is too much tendency to employ this very potent agent without due consideration. In its selection of writers the second volume is more catholic than the first; thus "Rheumatism" is from the pen of Dr. Poynton, "Cholera" by Dunbar of Hamburg, and "Bacillary Dysentery" by Shiga,—the names are guarantee enough of the quality of the articles. Dr. Koplik has a good article on "Cerebro-Spinal Fever"; "Smallpox" is treated by Councilman and "Vaccinia" by Dr. Dock. The chief infectious diseases of children have been entrusted to Dr. Ruhräh. Even in a review of this length it is impossible to engage upon a detailed notice of these, and we must content ourselves by saying that one and all attain a very high level of merit. Taking the new "System" as a whole, it differs in one respect from some of the other standard ones, and this is in the comparative absence of references. There is no uniformity in this respect, for some authors give them, others do not. Now, no doubt this is intentional, but we think that in a book of this size, which will become a standard work of reference, the names of the chief original papers on various subjects ought to be given, and we hope that in future volumes a change will be made in this respect. The new "System" is more fully representative of American than of English medicine; of the contributors to the first two volumes, about two-thirds belong to the Western Continent. The high standard of the published volumes will ensure the "System" a place among its compeers; it is a credit alike to American medicine and to the care and judgment of its distinguished Editor.

American Practice of Surgery. Edited by JOSEPH D. BRYANT and ALBERT H. BUCK. Vols. II. and III. New York: Wm. Wood & Co.

A GENERAL description of this colossal work was given on the occasion of reviewing the first volume some months ago. The high standard which characterised the first volume is fairly well maintained in the second and third, but we cannot say they are worthy in all respects of forming a part of what is intended to be the most comprehensive reference work on surgery in the English language.

In volume ii. the initial chapters are concerned with the description of diseases which belong in varying degrees to the domain of surgery, and which are observed in several parts of the United States and its dependencies and in Canada. These include leprosy, plague, glanders, anthrax, actinomycosis, mycetoma, rhino-pharyngitis mutilans, and scurvy. The descriptions of these infective diseases are comparatively short, but are quite complete in themselves, and, it need hardly be added, are well and profusely illustrated. In referring to the theory advanced by Jonathan Hutchinson, that the eating of badly cured or insufficiently cured fish is responsible in some way for the existence and spread of leprosy, it is frankly stated that such a theory does not appear to be tenable. With regard to the surgical treatment of leprosy, we are told that something can usually be done to remove or arrest its manifestations, with relief to the patient and also with marked influence on the progress of the disease.

The article on plague is largely based on the admirable work done in India; the rule never to incise or excise a plague bubo before suppuration has occurred would appear to be completely established. With regard to the local treatment of malignant pustule, the various conflicting opinions and practices are summarised, and the conclusion drawn that the surgeon must be guided by circumstances and use his own judgment in the choice of a mode of treatment suited to the case. Rhino-pharyngitis mutilans is defined as a destructive ulceration of the naso-pharynx prevalent in certain limited areas in the tropics, without constitutional symptoms, and usually running a self-limited course, with a tendency to cicatrisation. It is probably caused by a local fungoid or bacterial invasion.

The article on tuberculosis is by Gibney of New York, and is an admirable résumé of the subject. In the treatment of cold abscess the author declares that he has had a varied experience in its management, and he feels that the question how best to manage it is not yet settled. Notwithstanding the enormous amount of testimony that is to be found throughout surgical literature in favour of using iodoform glycerine, orthopedic surgeons in general are not disposed to commend the procedure, as the abscess frequently disappears under simple protection and rest. The author is also an advocate of the conservative treatment of tuberculous disease when it involves the bones and joints.

The article on syphilis is by Dr. Keys of New York, and it begins with the aphorism that syphilis requires a surgeon's diagnosis but rarely a surgeon's treatment. There is no description of the parasites which we at present associate with the etiology of syphilis, but the views as to treatment by mercury are agreeably orthodox.

The succeeding chapters deal with abscesses, ulcer and ulceration, and gangrene. The article on gangrene is a very extensive one, and reflects great credit on the author, Dr. Albert Wood of Philadelphia.

Diseases of the skin are dealt with to a certain extent from the surgical aspect, with a good many illustrations. The chapter is, in some respects, a disappointing one; for example, in describing fibromata of the skin, there is no mention of the varieties which are associated with lesions of the nerves.

The muscles, tendons, bursæ, fascia, and connective tissue are considered together in an article by Dr. Clark Stewart of Minneapolis.

The section on "Surgical Diseases and Wounds of Nerves" is one of the least satisfactory, being sketchy, badly arranged, and not up to date. There is "septic" instead of "spastic" paralysis; in the treatment of cerebro-spastic palsy we are told among other things that "circumcision should be performed when there are evidences of genital irritation, but the effect of this operation is of no marked benefit"; on another page it is related that "injury to the sympathetic nerve is followed by ptosis, and at the same time the pupils become irregular and the conjunctiva more vascular, while the nasal, salivary, and perspiratory secretions are diminished." Finally, in place of a proper description of the tumours of nerves, there is merely a translation, in small print, of a magazine abstract by Max Strauss.

The "Surgical Diseases of the Lymphatics," by Charles N. Dowd of New York, are very shortly but quite satisfactorily described and illustrated; the author is a strenuous advocate of the excision of tuberculous glands.

The remaining chapters in the second volume are concerned with burns, frost-bite, wounds of soft parts by cutting and piercing instruments, and, finally, gunshot wounds. This last section is by Major William C. Borden of the United States Army, and is a very complete account of the mechanism of gunshot wounds, the injuries of the different structures of the body, and, finally, of the different regions of the body. The experience gained in recent wars—except the Russo-Japanese—being extensively made use of, a great many quotations being taken from Stephenson and the writings of English surgeons who took part in the South African War.

The third volume consists of three parts, of which the first is devoted to "Poisoned Wounds" and to "Rabies." The article on "Rabies" has a full-page illustration of the so-called Negri bodies, but the author does not agree in accepting them as the specific protozoon of rabies. With regard to nitrate of silver, which is so often used for cauterising wounds resulting from the bite of a dog, every one will agree with the author when he says that it is worse than useless, as it almost invariably retards the healing of the wound, which, treated in the ordinary way, would promptly get well. Unless the wound can be cauterised with the cautery or with fuming nitric acid within an hour, it is better to abstain from such interference. The dog, if captured alive, should be watched for several days—eight to fifteen—in order to ascertain whether it is rabid or not. If it develops symptoms strongly suspicious of rabies, it should be killed and the brain examined for Negri bodies, as in this way a positive diagnosis can be made in less than twenty-four hours. The patient should then at once submit himself to the Pasteur treatment.

The second part of this volume is concerned with the "Injuries and Surgical Diseases of Bone," and extends to over four hundred pages. The illustrations of fractures are hardly up to the general standard of the work, and are mostly borrowed from foreign sources. An exception should be made of the article on "Pseudarthrosis," in which the original illustrations are excellent.

The "Inflammatory Affections of Bone" is from the pen of the late Dr. George Peters of Toronto, and is written in that author's best style, and shows a keen insight into the pathology of this difficult subject and a thorough grasp of the principles of treatment; in the account of Brodie's abscess he has adopted the views expressed by Alexis Thomson in a recent paper on the subject. The "Non-inflammatory Affections of Bone" are in the capable hands of Roswell Park of Buffalo. The illustrations of syphilitic disease of bone are among the best in the volume. The article on "Tumours originating in Bone," by Dr. Simmons of Boston, is a most instructive and well-illustrated production, and reflects the greatest credit upon its author. The account of the malignant tumours of bone is certainly the best we have seen in any work on surgery.

The remainder of the present volume deals with the "Injuries and Diseases of Joints." That by Primrose of Toronto on tuberculosis includes the bones as well as the joints, a very wise arrangement; the article is a very complete one, and is based on a large clinical experience, which is extensively made use of, the various types of the disease and methods of treatment being well illustrated. The treatment of tuberculous joints by means of Wright's opsonic index and Koch's tuberculin is fully described, and is said to promise to become an important addition to scientific surgery.

Under the heading "Chronic Non-tuberculous and Non-traumatic Inflammations of Joints," Dr. Charles Painter of Boston embarks on what at first sight appears to be a rational basis on which the diseases of joints might be classified, but, on reading further, we are doomed to disappointment, for the confusion, which is only too well known to exist with regard to the different chronic forms of joint disease, becomes a veritable chaos under the leadership of this author. The first group is called "Infectious Polyarticular Inflammations," and under this head we are introduced to acute rheumatism, to Still's disease, and to certain forms of chronic arthritis formerly called rheumatic; but any idea that the reader may have gained as to what is meant to be included under this head is utterly confused by references in the paragraphs on treatment to "acute suppurative inflammations of the gonorrhœal type," and to "profoundly toxic streptococcus infections." The second group is designated "Atrophic Arthritis" (Rheumatoid Arthritis), the name specially referring to the atrophy of cartilage, which is regarded as the essential feature. The third is called "Hypertrophic Arthritis" (Osteo-Arthritis); the fourth, "Chronic Villous Arthritis"; the fifth, "Foreign Bodies"—which is apparently regarded as an improvement on the traditional term "Loose Bodies." The sixth deals with "Joint Fringes"; the seventh, with "Syphilis"; and the eighth, with "Functional Joint Disease"—than which a more ambiguous term could hardly be selected. The ninth section describes "Reflex Joint Atrophy"; the tenth, "Gouty Affections of Joints"; and the eleventh, "Hæmophilia." The mere mention of these groups leaves the reader utterly confused on the subject of the classification of the diseases of joints.

The last section is entitled "Wounds of Joints"; it includes sprains, contusions, and hysterical joints, which is a somewhat odd collection to find included under wounds.

Diseases of the Eye: A Manual for Students and Practitioners. By J. Herbert Parsons, F.R.C.S. London: J. & A. Churchill.

In view of the many excellent Manuals of Diseases of the Eye available for the use of students and practitioners, we see no reason for adding to the number. Consequently a new manual is expected to justify its appearance. This the author has attempted to do mainly by facilitating the student's progress from his knowledge of the normal anatomy and physiology of the parts concerned to the consideration of their morbid anatomy and pathology. Throughout the work the anatomy and physiology of the various structures dealt with are at the outset very carefully considered, so that physiology and pathology are linked together in a manner which gives the book a standing all its own. Then the description of the fundamental and optical principles are carefully elaborated, the true appreciation of which being the only sure basis of correct diagnosis and successful treatment. In other respects the arrangement of the book is practically the same as that adopted in other similar manuals, except that retinoscopy and the correction of errors of refraction by spectacles have been deferred to near the end of the volume, as the author considers that this is the proper place for seriously attacking the diagnosis and correction of refractive and accommodative anomalies. With this contention we do not agree, for, in our opinion, refraction, which is the keynote to many ophthalmic affections, should be studied at an early stage in a course of ophthalmology, otherwise the causation of many diseases is unintelligible.

If this new volume is to outrival its predecessors, it will be because of the excellent way in which anatomical and physiological conditions are described, and of the soundness and freshness of its pathological teaching. The book is worthy of the author—one of the foremost ophthalmic physiologists and pathologists of the present day. We have thoroughly enjoyed its perusal, and have the greatest pleasure in recommending it.

Heart Disease and Thoracic Aneurysm. By F. J. Poynton, M.D., F.R.C.P. London: Henry Frowde and Hodder & Stoughton.

In this little work, which is one of the "Oxford Medical Manuals," the author first describes the methods of clinical examination of the heart and aorta, and then discusses all the rheumatic affections of the heart, grouping them together for the purpose, as he states, of providing one complete picture of heart disease rather than isolated sketches of pericarditis and endocarditis. This method of considering the subject appears to be both practical and useful. Thereafter, chronic valvular disease, non-rheumatic affections, and the diseases of the myocardium and of the neuro-muscular elements are dealt with, while the closing chapters treat of congenital affections, arterial disease, and aneurysm. The book gives a good description of the chief clinical features of cardiac and aortic disease, and the therapeutic measures at our command are fully described and criticised.

The text, which is carefully written, shows in how striking a manner recent research in clinical pathology has influenced our conception of cardiac disease, and its elucidation ante-mortem, but the author tells us very little about some of the most interesting physiological problems that may be met with in such cases. No direct reference is made to the effect of vagus stimulation upon the heart, to the extra-systole, nor to disturbance of excitability either of the auriculo-ventricular bundle or of the auricular and ventricular musculature; the description of the jugular pulse is too fragmentary to be of material assistance to the reader, and no adequate explanation is advanced for the peculiar distribution of pain in angina pectoris.

Diseases of Women. By G. Ernest Herman. Third Edition. London: Cassell & Co.

Dr. Herman's "Diseases of Women" is one of the clearest and most practical books on the subject extant. There has recently been published a third edition, which has been revised throughout, and in parts added to and improved. Two of the opening chapters are devoted to neurasthenia and hysteria respectively, and in them the author gives a concise account of these conditions, and expresses his views on the relationship between them and disorders of the female sexual organs with a lucidity and moderation that carry conviction. Of the newer matter, the section on chorion-epithelioma is still rather short, especially from the clinical standpoint; but it is excellently illustrated histologically by three fine micro-photographs of Dr. Teacher's. New and good illustrations have also been added to the chapter on malignant disease of the uterus. This subject is discussed in some detail, and the section on the diagnosis of cervical cancer is specially to be commended. Here, as throughout the volume, the author's vast clinical experience has enabled him to place the subject before the reader in the most practical light.

In all its sections the book is quite up to date, and the more recent work has been criticised and sifted in a masterly way, with the result that all irrelevant and controversial matter has been excluded, to the advantage of the reader, be he student or practitioner. The arrangement of the subjects is eminently practical, and, thanks to the author's trenchant style, they are all presented with the utmost perspicuity.

Gall Stones and Diseases of the Bile Ducts. By J. Bland Sutton, F.R.C.S. London: J. Nisbet & Co.

This little book, which is one of a series of clinical manuals, consists of lectures delivered by the author at the Middlesex Hospital. It is intended to supply the gap which exists between the inadequate consideration given to the subject of cholelithiasis in text-books of surgery and the monographs on the same subject, which are too big to be useful for students. Like other works written by the same author, it attains a high standard of excellence. It is eminently practical, clearly written, and, as might have been expected, very usefully illustrated.

With regard to the tables of mortality of operations performed for the relief of gall-stone disease, it is hardly fair to compare the results obtained at a private hospital, such as the well-known one at Rochester, Minnesota, with those performed in the public hospitals in this country; for, apart from the greater experience in this department of operative surgery possessed by the Mayos, there is a considerable difference between the cases admitted to a private hospital and to a public hospital, and between the respective staffs so far as the assistants and nurses are concerned. It is impossible for a surgeon working in a general hospital, with a change of house surgeons and dressers every six to twelve months, to compete on equal terms with a surgeon who can always command the services of a thoroughly trained, experienced, and, to all intents and purposes, a permanent staff.

The Major Symptoms of Hysteria. By Pierre Janet, M.D., Professor of Psychology in the Collège de France, Director of the Psychological Laboratory in the Clinic of the Salpêtrière. London: Macmillan & Co. Ltd.

This volume contains a series of fifteen lectures given in the Medical School of Harvard University, at the inauguration of the new buildings of that school. They contain a most interesting discussion of the main features of hysteria, and a luminous statement of the conceptions brought by Dr. Janet to the elucidation of its complex phenomena. They may be regarded as forming a summary of the views which have been worked in former publications. Among the subjects treated there may be mentioned the following:—Monoideic somnambulism, fugues and polyideic somnambulisms, double personalities including reciprocal and dominating somnambulisms, convulsive attacks, motor and sensory disturbances, respiratory and visceral disturbances. Diagnosis and explanation, rather than practical treatment, are the object of the lectures.

Passing in the last chapters to consider the fundamental condition in hysterical attacks, Dr. Janet points out two kinds of stigmata, those which are proper and those which are common, *i.e.* found in other nervous diseases. Of the former, the most important is suggestibility; the second is exaggerated absent-mindedness, in which the patient is completely indifferent to whatever is not the immediate object of attention; while the third consists in transference or equivalence of various hysterical phenomena. Finally, the different aspects of the disease are summed up in the statement that hysteria is "a malady of the *personal synthesis*," and that it is "a form of mental depression characterised by the retraction of the field of personal consciousness and a tendency to the dissociation and emancipation of the system of ideas and functions that constitute personality." We may point out also the view of the author that "the hypnotic state is nothing but the reproduction of an hysterical somnambulism, and, I do not hesitate to add, in a hysterical subject."

Post-Graduate Clinical Studies for the General Practitioner. By H. HAROLD SCOTT, M.B., M.R.C.S., L.R.C.P. London: H. K. Lewis.

THESE studies consist mainly of papers read by the author before various societies. The subjects dealt with are—"An Obscure Case of Cranial Injury," "Subphrenic Abscess," "Pleural Effusion and Empyema," "Disseminated Sclerosis," "Cerebral Hæmorrhage," "Embolism and Thrombosis," "Acute Endocarditis," "Naked-eye Examination of the Fæces," "Enteric Fever," and "Syphilis in the Army." They are treated in an interesting manner, but we can scarcely agree with the author when he says that the information to be obtained from ordinary text-books on these subjects is meagre and scattered. From the point of view of the general practitioner, we should say the most valuable is the paper dealing with the importance of the "Naked-eye Examination of the Fæces." As an addendum to the paper dealing with "Syphilis in the Army" are thirty-five large charts showing the admission ratios over a number of years from venereal diseases at various army stations. However valuable these may be in certain quarters, surely the already overburdened general practitioner might have been spared them!

Skin Diseases and their Treatment. By ARTHUR WHITFIELD, M.D., F.R.C.P. London: Edward Arnold.

THIS handbook of Dr. Whitfield's is eminently practical, and for treatment to be successful he insists strongly and rightly upon a proper understanding of the pathology of skin diseases. Without this, treatment will inevitably degenerate into a mere treatment of names, not of processes.

Considerable space is therefore given to description and diagnosis, particularly to the simpler of the accurate methods of examination of pus, scales, etc.

Treatment is, on the whole, considered in a sufficiently full and detailed manner, although, in some instances, *e.g.*, the exceedingly common one of "dandruff," it might with advantage, we think, have been fuller. The more specialised forms of treatment, such as by X-rays and opsonins, are referred to adequately for those for whom the book is intended—the student and the general practitioner. A word of praise must be given to the illustrations, most of which—the limits of skin-disease representation through the medium of the half-tone process being recognised—are excellent.

Practical Course of Chemical Physiology. By D. NOËL PATON, M.D., F.R.C.P.E., and EDWARD P. CATHCART, M.D. Edinburgh: Wm. Green & Sons.

THIS "course" may be taken as a type of what every teacher should have prepared for the use of his students in a practical class. With this as a guide, the student can give his time to the practical work; half of it is not wasted in making notes, which at the best can never equal in conciseness and accuracy a laboratory handbook of this character.

The course is divided into two sections—junior and senior; the former is intended for the ordinary medical student, to give him a training sufficient for the ordinary chemical investigations required in his clinical work; the latter gives a few of the more complicated methods employed in chemico-physiological research, and is intended rather for those taking an advanced course of physiology.

The book is interleaved throughout with blank pages, so that additional notes may be made where the user thinks necessary.

First Lines in Midwifery. By G. Ernest Herman, M.B., F.R.C.P. London: Cassell & Co.

We are glad to welcome a new edition of this handbook, as it is one which should prove of the greatest service to midwives and to those responsible for their tuition and inspection.

For medical students we hardly feel satisfied that it is quite suitable. It contains all that the midwife requires to know of the theory of obstetrics, expressed in a practical and succinct manner, aided with good diagrams and illustrations, but there is not sufficient for the student who is preparing him or herself for practice on a much higher plane and one of considerably greater responsibility.

Antiseptic precautions are described fully, but we should have liked to have seen them insisted on with greater stress, as the Listerian principles are undoubtedly the most difficult to instil into the midwives' mind. The new set of rules issued by the Central Midwives Board, with full explanatory notes, form a chapter (by no means the least important) by themselves.

A Study of Human Blood Vessels. By Arthur V. Meigs, M.D., Physician to the Pennsylvania Hospital. With 103 Original Illustrations. London: J. B. Lippincott Company.

In this volume the author gives a description of the appearances which he has observed in blood vessels in health and disease.

We rise from a careful perusal of it with a feeling of great disappointment, since the facts presented do not bear out the promise of the preface, that new light would be thrown upon this important subject.

Our feeling is that if the author had consulted a later edition of Ziegler's "Pathology" than that translated by Macalister and published in 1883, or if he had considered the numerous text-book articles, and separate monographs on Inflammation, Thrombosis, and Cardio-vascular Physics, which have appeared within more recent years, he might have found that more is known and figured in connection with disease in vessels than he assumes throughout his book, while the observations he has made so laboriously might, as a result, have been set forth with more profit to the reader.

Taking the volume as a whole, we are of opinion that it does not add greatly to the sum of our knowledge, and the amount of useful and new information it contains is not sufficiently large to justify us in recommending it to our readers.

The Bacteriological Examination of Water Supplies. By William A. Savage, B.Sc., M.D., D.P.H. London: H. K. Lewis.

In this volume the writer has endeavoured to give a clear account of the various methods for the bacteriological examination of water, and of the present state of our knowledge of the subject. He has dealt with his subject in a way which will commend itself to those engaged in the examination of waters. The chapter on the interpretation of results is especially good, and in it he again draws attention to the necessity for giving the fullest details as to the origin of water samples, if a trustworthy opinion is to be formed by the bacteriologist. He says: "To expect a bacteriologist to pronounce a trustworthy opinion on a water of unknown origin is absurd, and is a task which should never be undertaken by him."

A Manual of Pathology. By Guthrie McConnell, M.D. Philadelphia and London: W. B. Saunders Company.

This book is a short review of the subject of Pathology, and the author only claims for it that it "shall enable the student especially to rapidly acquire the salient points of a subject." We feel that too much has been attempted, and subjects of relatively small importance have been given almost as much space as the fundamental subjects of pathology. The necessary result is that any student who reads the book must get a very superficial knowledge. To the subject of inflammation and regeneration, for example, about ten pages are devoted, and of these almost two pages are used to define twenty-three varieties of inflammation, the value of which, so far as we can see, is absolutely negative. Many of the fundamental facts are omitted, and almost all the recent work on the subject has been ignored.

Under "nephritis" many of the old errors reappear. There are some parts of the book which are good, but, taken as a whole, we feel that the student of pathology will be well advised to avoid this manual.

NOTES ON BOOKS.

Prof. J. George Adami has published, under the title *Inflammation* (Macmillan & Co., London), a revised reprint of his article in Prof. Allbutt's "System of Medicine." Starting with the definition of inflammation as "the reaction of irritated and damaged tissues which still retain vitality," the author traces the essentials of that reaction from the amœba upwards through the animal kingdom, describing the part played by the various factors. No qualitative distinction can be drawn between the repair of an aseptic wound and the tissue changes which occur in the presence of bacteria: the steps in the reaction are identical, and the difference in the two cases is only in the intensity of the irritant. We are forced to the somewhat paradoxical conclusion that aseptic repair causes practically no symptoms because the reaction of the tissues, *i.e.* the inflammation, is adequate, while those cases which show the classical signs—redness, heat, etc.—are almost invariably cases of inadequate inflammation. Naturally, his conclusions on so difficult a subject will not all be universally accepted. It is impossible here to do more than mention the mass of research work quoted by the author, and his closely reasoned argument. The book is one which will thoroughly repay the most careful perusal.

Mr. C. B. Lockwood has collected and reprinted, under the title of *Clinical Lectures and Addresses on Surgery* (Henry Frowde, London), a number of lectures chiefly delivered to students. From their origin most of them are necessarily conversational in style, and contain a considerable number of references to individual cases in the wards. He discusses the processes of clinical reasoning, the essentials of a diagnosis, and various common conditions, such as varicose veins, inguinal swellings, and carcinoma of the breast and of the tongue. He attaches great importance to the immediate microscopical examination of the nature of tissues during the course of an operation. The rapid method of freezing, cutting, and staining is described, and forms, with the accompanying lecture, one of the most interesting chapters in the book.

A second edition has appeared of *Nursing, General, Medical, and Surgical*, by Wilfred J. Hadley, M.D. (J. & A. Churchill, London). Perhaps the best part of the book is that on "General Nursing," where sound advice and directions are given in considerable detail. There are chapters on the more common medical diseases, fevers, skin diseases, and diseases of women and children, including the management of labour, and also a section on surgical nursing. In them, in view of the amount of ground covered, there is unavoidably an occasional lack of detail. The book does not aim at being a text-book for reference, but forms an excellent introduction to the various branches of nursing. There are added an appendix on sick-room cookery, and a short dictionary of the more common medical terms.

Another small text-book for nurses is the fifth edition of *Lectures on Medicine to Nurses*, by Herbert E. Cuff, M.D. (J. & A. Churchill, London). The author explains that he has gone more fully into the details of diseases than is usual in works of this class, his aim being to meet the wants of the nurse who desires more information than is given in most books written for her profession, but to whom a students' text-book, owing to its technical language, is unsatisfactory. The writer has been extremely successful in giving in everyday language, with just the necessary amount of anatomy and physiology, a clear description of the diseases he has chosen, and the reasons for the methods of treatment. The chapters on "Germs and Infection," "Inflammation," and "Hysteria" are good examples, while that on "The Use of Stimulants in Cases of Acute Illness" is a simple and admirable statement on this rather vexed question.

If we were to state that "Hale White" had reached a tenth edition, our meaning would probably be clear to most of our readers, for Dr. Hale White and his *Materia Medica* (J. & A. Churchill, London) are, to many, almost synonymous terms. The 1907 edition embodies all the good features of its predecessors, and brings into line the results of more recent research and experience. We specially note additions in the section devoted to the pharmacopœial substances derived from the animal kingdom. In this the various sera and antitoxins of accepted value are fully described as regards their preparation, mode of administration, and action.

Gadd's *Synopsis of the British Pharmacopœia* (Baillière, Tindall, & Cox, London) has also reached a new edition, which appears to be just a reprint of the last.

In Dr. Startin's *Skin Pharmacopœia* (J. Wright & Co., Bristol) we have a sixth edition which has several valuable additions to the former one. This little book contains a number of formulæ in use at the London Skin Hospital, and appended to each a note of the uses to which it is applied and also some notes on diet and classification. The prescriptions can be heartily recommended as a basis for the student to build his own armamentarium upon.

A useful guide to routine side-room work is Dr. Robinson's *Guide to Urine Testing for Nurses* (John Wright & Co., Bristol), but we note two points which might be made clearer, firstly, that an accurate test for albumin cannot be carried out in a cloudy urine without preliminary filtration, and, secondly, that a high specific gravity does not necessarily indicate a pathological condition of the urine.

School Inspection is dealt with by Dr. Crowley in a pamphlet entitled *The Need, Objects, and Method of the Medical Inspection of Primary Schools.* This is a paper read before the Medical Officers of Schools Association, together with the subsequent discussion, and it gives a very fair synopsis of the subject.

A reprint from the *Public Health Engineer* on the *Disinfectant Value of Chlorine* contains contributions from numerous public health authorities, and deals fully with the use of chlorine as a disinfectant under a variety of conditions both in the laboratory and in public health practice.

This small work—*Some Points in the Surgical Anatomy of the Temporal Bone from Birth to Adult Life*, by A. H. Cheatle, F.R.C.S. (J. & A. Churchill, London)—is based on the study of 500 specimens which were shown by the author at the Hunterian Lectures, delivered at the Royal College of Surgeons, England, in 1906. The subject matter is divided into three lectures. The first deals with the anatomy of the temporal bone at birth and with the surgical anatomy of the labyrinth. In the second, the superficial changes in the bone during growth are described; the variations of the antrum and mastoid cells and of the middle ear proper are also dealt with. Lecture 3 is devoted to a description of the surgical anatomy of the antrum, facial and auditory nerves, etc. There are a very large number of excellent illustrations of actual specimens depicting the various points described in the text. The author is to be congratulated on a painstaking and creditable piece of work.

This recently published handbook—*The Laws of Health*, by Carstairs C. Douglas, M.D., D.Sc. (Blackie & Son, Ltd., London)—on school hygiene has appeared at a time when increased attention is being paid to the bodily health of school children, and should prove of service to those who are being trained for the teaching profession. The scope of the book is necessarily wide, and Dr. Douglas has wisely restricted the anatomical and physiological portion. The chapters on infectious diseases in relation to school life are clearly and succinctly written, as is also that on the simpler ailments of children.

Of three books dealing with "The Captain of the Men of Death," we especially welcome a third edition of Dr. Latham's *Pulmonary Consumption* (Baillière, Tindall, & Cox, London). The reception accorded to the previous editions has proved that this work has made a place for itself and come to stay. The chief additions made to this edition are sections dealing with the value of the opsonic index in diagnosis and treatment, and with the use of manual labour in sanatorium treatment. With regard to the opsonic index, Dr. Latham has no great belief in its value in the present stage of our knowledge of opsonins.

La Tuberculosi, by Drs. Valtorta and Fanoli (Hoepli, Milan), is the title of one of Hoepli's well-known Italian manuals which covers pretty much the same ground, but goes rather more fully into the pathological anatomy, while sanatorium treatment is dismissed all too briefly.

In his *Pulmonary Tuberculosis* (John Leng & Co., Dundee), Dr. David Crichton makes out a good case for his view that the chief predisposing condition is a paresis of the sympathetic nerves as shown by the loss of vascular tone and diminished blood pressure. The various recognised forms of treatment, he considers, act mainly by improving this condition, and not the least valuable in doing so may be autosuggestion.

Mr. Page has written a text-book (*Elements of Physics for Medical Students*, Cassell & Co., London) which, in his preface, he says, covers the syllabus of the London Conjoint Board and Society of Apothecaries' Examinations in Physics. So far as it goes it is an excellent little book, but we should be sorry to think that all medical students were content to begin their more purely medical studies with only the knowledge of physics that is contained in this work.

The possibility of the New Sydenham Society shortly terminating its existence gives a special interest to these two numbers of the well-known "Atlas"—*Illustrations of Clinical Medicine, Surgery, and Pathology*, Fasc. xxv. and xxvi. (London). They are in every respect worthy of their predecessors. The first deals with "Variola, Vaccinia, and Varicella." If the coloured plates illustrating the first of these conditions are not quite so convincing as the photographs in the previous fasciculus on the same subject, this objection does not apply to the other subjects illustrated. The photographs of "Varicella" especially are very good. The second number illustrates "Eczema," "Lichen," "Tinea," and various other conditions, including a good example of gout tophi. The plates are good and the fasciculus, which we hope will not be the last, will prove very useful to all practitioners of medicine.

It is unnecessary to say anything in praise or criticism of a little book—*What to do in Cases of Poisoning*, by William Murrell, M.D., F.R.C.P. (H. K. Lewis, London)—which has occupied a unique place amongst our medical publications during the last twenty-five years, and which has now reached a tenth edition. In praise much might be written; in criticism, little which would materially detract from the excellence of the advice or the accuracy of the facts contained in its pages. The volume is still quite handy, although, if it continues to grow, it bids fair in its present form to lose this merit.

The aim of *Modern Methods in Urinary Surgery*, by Edward Deanesly, M.D., F.R.C.S. (H. K. Lewis, London), is to state shortly for the benefit of the general surgeon the facts indicated in the title. The interpretation of urinary symptoms, especially pain and frequency of micturition, is discussed, as also are the routine methods of examining the urine, the significance of abnormalities in it, and the means of testing the functional value of the kidneys by cryoscopy and other procedures. The cystoscope and segregator and the method of using them are described. Though everyone who calls himself a specialist in surgery should already know all that is in this book, we can well believe, as the author asserts, that there are many general surgeons who do not employ the most modern means of urinary diagnosis. In any case, this little volume contains a compact statement of the essential facts.

Lessons in Disinfection and Sterilisation, by F. W. Andrewes, M.D., F.R.C.P. (J. & A. Churchill, London), may be regarded as bearing the same relation to a manual of bacteriology as an advanced ambulance handbook bears to a text-book of surgery. It is intended especially for those who, like nurses, possess no special knowledge of bacteriology, but are nevertheless daily engaged in practical work in surgery and midwifery which cannot be intelligently performed without some slight acquaintance with the general principles of that branch of pathology. The elementary facts of the biology of micro-organisms, the means by which they are killed, and the practical application of these facts in medicine and surgery, are clearly stated. A series of simple bacteriological experiments illustrative of the various lessons is suggested. We know of no other book which is written on quite the same lines, and it should be both interesting and valuable to those for whom it is intended.

This—*Ulceration of the Cornea*, by Angus MacNab, F.R.C.S. (Baillière, Tindall, & Cox, London)—is a valuable little work, and will be of great use to the ophthalmic surgeon, for it presents in a concise manner all that is known regarding corneal ulceration from the bacteriological standpoint. We heartily recommend the book to those who desire information on this important subject, for although there are some inaccuracies, it is well worthy of a careful perusal. The author is to be congratulated on the success of his labours.

The fifth edition of this well-known work—*The Clinical Use of Prisms*, by Ernest E. Maddox, M.D. (John Wright & Co., Bristol)—has been carefully revised, somewhat enlarged, and brought thoroughly up to date. Everything worth knowing about prisms and decentration of lenses will be found in the book. We commend the new edition to the careful attention of ophthalmic surgeons as a thoroughly reliable and readable guide to a subject bristling with difficulties.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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THE DIAGNOSIS OF TUBERCULOSIS.

THE "OPHTHALMO-REACTION."—Professor Calmette has lately (*Presse méd.*, Paris, 1907, June 19) introduced a new means of diagnosing tuberculosis by the use of tuberculin, which, if his results be confirmed, seems destined to be of great practical usefulness, avoiding, as it does, both the inconveniences attaching to diagnostic inoculation and the complication of determining the opsonic index, and being of so simple a nature as to bring it within the reach of any practitioner. The test has received the name, "Ophthalmo-Reaction." Von Pirket (*Deutsche med. Wchnschr.*, Leipzig, 1907, May 23 and 30) has shown that if a small quantity of tuberculin be introduced into a scarification on the skin of a tuberculous subject, a reaction occurs, which is at least exceptional in healthy individuals. After forty-eight hours some redness and œdema is seen, and a papule, not unlike that of vaccinia, develops. Within a week this dries up, and the reaction subsides. It occurred to Calmette to inquire whether the mucous membranes, particularly that of the eye, which absorbs microbial toxines with such facility, were capable of showing an analogous response. His first series of experiments were made on sixteen tuberculous and nine non-tuberculous adults and children. In order to avoid the irritating effect of glycerin on the conjunctiva, he used exclusively the dried tuberculin, precipitated by 95 per cent. alcohol, dissolved in sterile distilled water, so as to make a 1 per cent. solution. Fresh solutions only were employed. A single drop of this was instilled into one eye of each patient. If the reaction is positive the first signs appear in from three to five hours after instillation. There is evident congestion of the palpebral conjunctiva, which quickly becomes œdematous; the caruncle swells, and becomes reddened and covered with fibrinous secretion. This vascular engorgement becomes gradually more accentuated, and is accompanied by lachrymation. After six hours the fibrinous exudation becomes more abundant, and collects in shreds in the conjunctival sac.

The maximum intensity of the reaction is attained in from six to ten hours. Patients complain of little discomfort; there is no pain, no chemosis, and no elevation of the rectal temperature. In children the phenomena subside in about eighteen hours; in adults they last rather longer. The eye which has not received the tuberculin is not affected. In non-tuberculous subjects the positive reaction is not met with; instillation produces either no effect whatever, or at most slight reddening of the conjunctiva, which is of very short duration, and is not attended by any exudation or lachrymation. Calmette obtained a positive reaction in twelve cases of pulmonary tuberculosis in all stages, in two cases of tuberculous pleurisy, and in two cases of glandular tuberculosis. In one of the last mentioned (enlargement of bronchial glands) the diagnosis of tubercle had not been definitely made until the reaction was obtained. His controls (negative) comprised hysteria, tabes, lymphangitis, cardiac disease, cerebral sclerosis, katatonia, influenza, and acute rheumatism.

Short as has been the time that has elapsed since the publication of Calmette's observations, a number of communications, all bearing out the value of the ophthalmo-reaction, have appeared in the French press. Letulle (*Presse méd.*, Paris, 1907, July 3) reports on fifty observations on patients selected at random from his service. Nineteen of these reacted positively. He does not give details of all, but is apparently convinced of the accuracy of the sign. One case specially referred to is that of an old morphinomaniac, suffering from nephritis, and admitted in a dying condition, covered with boils, abscesses, and ulcers from hypodermic injections. Four days before death he showed a positive reaction, and at the autopsy an unsuspected lumbar abscess, from spinal caries, was discovered. A second example of the value of the test was furnished by a patient suffering from very severe typhoid, who developed consolidation of an apex. Convalescence being very slow and unsatisfactory, with evening rises of temperature, tuberculosis was suspected. The test, however, was negative, and events showed it to have been right. Letulle rates the prognostic value of the ophthalmo-reaction as high as the diagnostic importance, and to indicate this quotes the case of a nurse who contracted mild typhoid, in the course of which a small focus of pulmonary consolidation was detected. She made a good recovery, and would have been discharged without more ado but for the positive ophthalmo-reaction, which was taken to mean tuberculous lung mischief, for which a further course of treatment was instituted. In Letulle's opinion the ophthalmo-reaction is of great value in deciding whether a patient with signs of former lung disease is really cured, or whether the tuberculosis is only latent.

Comby (*Presse méd.*, Paris, 1907, August 10) reports his observations on the reaction in children. He first used a $\frac{1}{100}$ solution of tuberculin, but finding that this at times evoked a rather severe reaction—injection of the globe, epiphora, fibrine purulent exudation, and œdema of upper and lower eyelids—he now employs a strength of only $\frac{1}{200}$. This he has tried in 108 cases, without ever producing more than the moderate reaction, which is as conclusive as the severe one, without being attended by any inconveniences. According to him, the earliest indication of a positive reaction is shown in five to ten hours, by slight redness about the internal canthus and swelling of the caruncle. Very often the reaction remains limited to its seat of origin, but a more generalised conjunctivitis may occur. Three grades of reaction are distinguishable—(1) Slight, which may pass unobserved, unless the inner canthus is carefully looked at and compared with that of the opposite eye; (2) moderate, giving the aspect of a mild acute conjunctivitis; and (3) violent, resembling purulent ophthalmia. The last never occurs when a $\frac{1}{200}$ solution is used. The reaction should not be tested unless the eye is quite healthy; there is no other contra-indication. In Comby's series of 132 cases sixty-two reacted, seventy did not; he gives no details as to the clinical diagnosis, but states tha four post-mortems from the first set revealed tubercle, while six from the second set showed its absence. He concludes by saying that the ophthalmo-reaction is a certain, safe, and practical means of diagnosing tubercle in the child.

Sabrazès and Dupérié (*Gaz. hebd. d. sc. méd. de Bordeaux*, 1907, July 1) report a series of cases of the application of the test, and give clinical details. They distinguish the same three grades of reaction, as well as an early (six hours) and a late (twelve hours) reaction. Some of their observations may be summarised: Five cases of phthisis in different stages, all bacteriologically verified. Reaction early in four, late in one, moderate in four, slight in one. Pyrexia produced in one case. The reaction had no relation to the seventy of the tuberculous injection. Two doubtful cases (no bacilli found)—one with signs and symptoms of phthisis, the other with symptoms only, and a history of hæmoptysis. The first gives a positive, the second a doubtful reaction. Two cases of pleurisy, one recent, with exposure to tuberculous infection, one of old standing; both gave marked reaction, one early, the other late. Cases of enlarged cervical glands, a consolidation of an apex, osseous tubercle, and senile tubercle also gave a reaction. As regards the cases of cured tubercle, one, an old woman of 75, who was known to have had phthisis years before, gave no reaction; while a second case of healing tuberculosis, in which bacilli had disappeared from the sputum, gave a slight reaction.

The test has also been studied by oculists, and, from their point of view, apparently it is quite harmless. Brunetière (*Gaz. hebd. d. sc. méd. de Bordeaux*, 1907, July 18) got negative results in syphilitic eye affections; he counsels caution in applying the test when there is any conjunctivitis. Aubault and Lafon (*ibid.*, August 4) describe the appearances of the eye in detail. Practically, a slight conjunctivitis is caused; there is no corneal involvement, nor injection of the episcleral vessels or deeper structures. If the reaction is very intense, signs of it may last for a week; in none of their sixty cases did iritis or deep inflammation occur. They got a positive reaction in a case of solitary tubercle of the choroid, in two cases of phlyctenular keratitis, in episcleritis, in tuberculous interstitial keratitis, and in optic neuritis from tuberculous nodule; in the test the reaction was negative. Dry tuberculin, suitable for employment, is now obtainable commercially in France, under the name of Calmette's test.

The diagnosis of genito-urinary tuberculosis.—Two recent papers on this subject deserve short reference. Rolly (*München. med. Wchnschr.*, 1907, July 30) critically studies the bacteriological aspects of the question in relation to the identification of acid-fast bacilli in the urine. In the first place, the smegma bacillus may be found about the genital organs of most persons, both men and women. It may even contaminate catheter specimens of the urine. Second, by no known cultural or tinctorial reaction can the smegma bacillus be absolutely distinguished from the tubercle bacillus. Individual organisms of both strains, simulating each other very closely, can always be found. Third, animal inoculation is the only means of identification. Fourth, in a certain proportion of tuberculous patients, tubercle bacilli can be found in the urine on centrifuging, apart from any tuberculous lesion of the genito-urinary tract.

Seeing that the bacteriological diagnosis is so unsatisfactory, is there no other means of deciding whether a chronic urinary disease is tuberculous or not? Moscou (*Presse méd.*, Paris, 1907, July 5) draws attention to some new observations by Colombino of Turin. Moscou appreciates the bacteriological difficulties, and dismisses animal inoculation on account of its impractical nature and the delay it occasions. He controlled Colombino's work bacteriologically, however, and found that he could usually isolate the organism in well-marked, clinically evident cases, while in clinically doubtful ones the bacteriological test failed. His results with Colombino's method have been more gratifying. This observer described a characteristic deformation of the leucocytes in the urine in tuberculosis of the genito-urinary tract. In eighteen cases of verified genito-urinary tuberculosis, Moscou found that more than half of the leucocytes were deformed. On examination of fresh specimens, they showed an irregular, crenated outline, with small transparent buds at the margin of the cytoplasm. The nuclei were indistinct, and no granules could be seen. The ordinary leucocytes of non-tuberculous urine preserve their regular, rounded contour, and show both nucleus and granules. The above changes were equally apparent in triacid and Giemsa stained specimens. In both tuberculous and non-tuberculous urines 90 per cent. of the leucocytes are polynuclear, and it is among these that the budding and loss of granulation is seen. Moscou, however, did not find that the changes were quite constant. Of twenty-two cases, eighteen afforded a positive, four a negative result. He also examined urines of patients suffering from non-tuberculous genito-urinary diseases, and in them found, almost without exception, that the leucocytes were normal. Twice, however, in a case of calculous cystitis, and a case of acute gonorrhœa, the same deformation of the cells was present. Colombino's sign, therefore, has only a relative value. It is present in the great majority of cases of genito-urinary tuberculosis, and in only a small proportion of non-tuberculous affections. The cause of the altered appearance of the cells is not clear. Neither the reaction of the urine, its density, the freezing point, nor the urea content throw any light on the subject. The same deformation is found whether the urine is examined at once, or not until several hours have elapsed after it has been passed; it is also found in urine withdrawn by ureteral catheterisation. Normal leucocytes, added to urine which contains the deformed cells, do not undergo the same alteration, nor do the deformed cells regain their normal appearance on being put into healthy urine. In isotonic saline solution the deformity, however, disappears.

According to Tinel (*Gaz. d. hôp.*, Paris, 1907, August 8) we must now recognise among tuberculous nephritides not only waxy and parenchymatous nephritis, but an acute form, which resembles ordinary acute Bright's disease. In the absence of other evidences of tubercle, its distinguishing features are, low arterial tension, polyuria, large quantities of albumin and blood, and uræmic symptoms, referable rather to the gastro-intestinal tract than to the nerve centres. The author also regards many forms of albuminuria as attenuated nephritis of tuberculous nature.

SURGERY.

UNDER THE CHARGE OF

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Surgery of the Lung.[1]

Friedrich of Greifswald contributed a paper on the "Surgery of the Lung." As it is not always possible to differentiate between *abscess* and *gangrene*, he considers these two conditions together. The difficulty in making an accurate diagnosis, especially as to the seat and number of diseased foci, is often a hindrance to surgical treatment, and while it must not be ignored that a certain percentage of meta-pneumonic abscesses heal spontaneously, yet an early operation gives the best prognosis. Old abscesses and gangrenous cavities are liable to develop great thickening of their walls, with infiltration and induration of the surrounding tissue, and secondary bronchiectatic changes may take place round about, and these changes may interfere with healing. While, therefore, in the early stages, simple incision and drainage may suffice, in cases of old standing it may be necessary to resect portions of the chest wall, and possibly portions of the wall of the cavity and bronchial fistulæ. The X-rays have proved helpful in diagnosis, and have enabled us to recognise foci of disease and cavities at an earlier stage than previously. The diagnosis of the presence, extent, and strength of pleural adhesions is uncertain. A properly applied circular suture of the two layers of the pleura, the suture being inserted also through the intercostal muscles, guarantees the pleura against infection, and by fixing the lung to the chest wall prevents the occurrence of pneumo-thorax. If a two-stage operation is possible, which, however, is not always the case, packing against the pleural stitch for one or two days increases the formation of adhesions. To be able to identify the pathological changes in the lung, it is better to work with knife and scissors, rather than with the cautery. The insertion of an exploring needle with a lateral opening will often indicate the seat of the disease, and blunt boring with the finger to expose the focus should be avoided. Whether the focus is discovered or not, the wound is then packed to secure an efficient external opening; as, if the focus has not been opened up, it is likely to discharge spontaneously. The author raises the question whether, in extensive gangrene of one lobe, it would not be advisable to proceed at once to resect it, if the patient is able to stand the operation.

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[1] The papers here abstracted were read before the Congress of German Surgeons held in April 1907. (*Centralbl. f. Chir.*, Leipzig, 1907, August 3, Supplement.)

In cases of *bronchiectasis* the conditions are not favourable for operation, because there are multiple cavities in one, or it may be, in several lobes. The opening of one cavity may do more harm than good, as the formation of a bronchial fistula may impair the patient's power of expectoration. When the bronchiectasis is limited to one lobe or part of a lobe, it is probably better to excise it. Garré thinks that the bad results in bronchiectasis are partly due to the cases being operated upon too late.

Although many attempts have been made to treat *tuberculous lesions* of the lungs surgically, very little has been achieved, and direct interference with a phthisical cavity has not yielded good results.

For *foreign bodies* lodged in the bronchi, Killian's bronchoscope has shown the way to successful removal.

Sauerbruch's *pneumatic operation chamber* has proved of great value in the prevention of pneumo-thorax, which favours the extension of infection; and this appliance has enabled the author to perform exploratory thoracotomies at an early stage of the disease.

With regard to the *narcosis in lung operations*, Friedrich says that a general anæsthetic is only required at the beginning and at the end of the operation. All manipulations of the visceral layer of the pleura and of the lung may be done without it. He has used alternating chloroform and ether. He maintains that success in operating on the human lung can only be obtained by diligent practice on the lungs of living animals.

Lenhartz of Hamburg has operated upon eighty-five cases of gangrene, five of abscess, four of cancer of the lung, and eleven of extensive bronchiectasis. Of the gangrene cases thirty-two died, and of the abscess cases, one. In chronic cases of bronchiectasis limited to one lobe, the only treatment to be adopted is resection of the affected portion of lung, and this surgeon has in doing this tied the right main bronchus, and a few days later cut away the whole lobe of the lung successfully. The diagnosis of cancer of the lung is not so difficult, he thinks, if attention is paid to examination of the sputum for fat droplets; to X-ray examination; to physical examination; and to exploratory puncture. Of the four cases he has operated upon, one was alive and well a year later. He operated in two stages, first making a window in the thorax, and, a few days later, opening the pleura with the cautery.

Küttner of Marburg has operated three times on the human lung in the pressure chamber, and expresses a high opinion of it. One operation was a very severe one, lasting two hours, and yet the respiration was normal throughout.

TORSION OF THE GREAT OMENTUM.

THE frequency with which laparotomy is performed nowadays has drawn attention to this condition, which appears to be more common than was previously supposed. There are now some fifty-two cases on record. A considerable number of these cases have been diagnosed as appendicitis, but this error is not entirely to be regretted, as it has sometimes been the means of bringing the patients to operation at a sufficiently early stage of the condition to admit of relief being given. Adler records the case of a man, æt. 39, who, since he was 18 years of age, had suffered from a right-sided irreducible inguinal hernia. In December 1904 he became ill, with fever, vomiting, and severe pains in the right lower abdominal region. This was diagnosed to be an attack of appendicitis, but he was not operated upon, and under treatment with ice and opium the more acute symptoms subsided within three days. The pain persisted, however, in the right lower abdomen, and in the situation of the hernia there appeared a hard, irreducible, and very tender swelling. This was apparently continued into a very tender area of resistance, occupying the whole right lower half of the abdomen; and this latter swelling was regarded as an inflammatory exudate due to the appendicitis. At the operation, seven weeks after the onset of the illness, the condition was found to be a torsion of the great omentum, which had been twisted 360°, in the direction of the hands of a watch. As a result of the torsion, there was severe venous stasis and hæmorrhagic infarction in the tumour. The mass removed was 31 cms. long and 11 broad. The lower part of it lay in the hernial sac, and the part just above the site of rotation was close to the transverse colon. It thus involved practically the entire great omentum. The operation resulted in complete cure.

In such cases the diagnosis is always difficult, as the symptoms are liable to be confused with those of appendicitis, strangulated hernia, intestinal obstruction, cholecystitis, rotation of an ovarian cyst, etc. The diagnosis should be easier when there has previously been a reducible, soft, insensitive omental hernia, which becomes suddenly irreducible, hard, and tender, with at the same time fever, vomiting, and symptoms of obstruction, and the tumour appears on the same side of the belly as the hernia. While under observation, the hernial swelling increases in size and its continuity with that in the abdomen can be made out. The prognosis is good if early operation is performed, even if there is already peritonitis. The operation should always begin with the free exposure of the existing hernia, and if the hernial contents are continued into the abdominal swelling, the abdomen must be opened.

SURGERY OF THE SPLEEN.

KÜTTNER of Marburg records a case of *extirpation of the leucocythæmic spleen.* The patient was a woman, æt. 45, suffering from myelogenic leucocythæmia of five years' standing, who was supposed to have been benefited by X-ray treatment, as the enlarged spleen became less, and the condition of the blood improved. In the beginning of 1905, however, the spleen began to increase in size again, and gradually descended till it reached the pelvis, forming there a tumour like a gravid uterus. The patient was greatly reduced by her sufferings, and was unable for work.

Küttner was led to operate because, as the spleen had wandered so much, it was not likely to be associated with adhesions; and further, the patient had never shown any tendency to hæmorrhage. The operation was done in July 1906, through an incision in the middle line, and the spleen was very easily removed. The splenic artery was as large as the femoral, the vein the size of the inferior vena cava. The only difficulty was the separation of this thin-walled vein from the pancreas. The patient made a good recovery, and was out of bed on the eighteenth day. She gained in weight, and eventually was able to do all her household work. The leucocythæmic condition was not influenced in the least by the operation.

The same surgeon describes as *sequestrating abscess of the spleen*, one in which mixed with the pus there are large necrosed portions of the parenchyma of the organ, corresponding to what has been seen in the liver and in the kidney. He has observed two cases, in each of which there was a left-sided subphrenic abscess. In one case, that of a woman, æt. 35, the abscess had perforated the pleura, and large necrosed portions of spleen were extruded with the pus. The nature of the condition was only recognised on post-mortem examination, the patient having died two weeks after operation, from syphilitic disease of the aorta. The second patient, a lad of 19, recovered, and the nature of the necrosed tissue was readily recognised even by the naked eye.

In addition to these two cases, there are forty-one cases of this condition on record, corresponding to a proportion of 37 per cent. of the 116 cases of splenic abscess. The cause of the condition varies: in 14 per cent. it was traumatic; in 26 per cent. septic, especially in puerperal conditions; in 14 per cent. it was due to typhoid; and in 16 per cent. to malaria.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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The Indications for Operation on Uterine Fibroids.

Olshausen (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. lix. Heft 1) divides the indications into two groups—those which constitute a danger to the patient's life, and those which only menace her health. The former includes peritonitis, ascites, uræmia, and severe bleeding. The second group includes bleeding, pain, rapid growth, and difficulty in micturition. Olshausen does not consider severe pain a frequent indication for operating, as it very often disappears spontaneously with change in position of the fibroid. Bladder symptoms, however, call for early operation. The "small cystic" degeneration of the ovaries, a condition very frequently found in normal pregnancy and diseases of the tubes and ovaries, which cannot be diagnosed until the abdomen is opened, should not be regarded as reasons for removing a fibroid tumour. Myomectomy during pregnancy is not looked on with favour, as it is impossible to be sure how far the tumour extends into the uterine wall. With reference to the relationship of fibroid tumours and malignant disease, Olshausen believes that their presence favours the occurrence of cancer of the uterine body. This complication is, however, only met with in 5 per cent. of the cases, and this frequency does not justify prophylactic removal of all fibroids, till such time as hysterectomy can be performed, with a mortality of only 1 per cent. Sarcomatous disease is generally characterised by excessive bleeding after an interval of amenorrhœa, severe pain, and rapid increase in size of the tumour.

THE NOMENCLATURE OF ENDOMETRITIS.

THIS paper (*Journ. Am. Med. Ass.*, Chicago, vol. xlviii. p. 1002, No. 12) is the result of the work of a committee formed by the American Medical Association to discuss this question. Reference is made to the anatomy of the endometrium, which shows that it is influenced by all inflammatory affections, displacements, new growths, and congestions of the pelvic organs. According to some, endometritis should always be regarded as the result of micro-organismal infection. The authors think that the classification of endometritis should be into acute and chronic forms, *i.e.* purely anatomical, and not based on etiological factors or clinical symptoms. Endometritis, as such, very rarely, except in acute cases, occurs alone, but is usually complicated by inflammatory lesions of the cervix, or other pelvic conditions. In treating the condition, those lesions which accompany or produce the endometritis should not be overlooked.

A NEW METHOD OF TREATMENT FOR INOPERABLE CANCER OF THE UTERUS.

G. GELLHORN (*Journ. Am. Med. Ass.*, Chicago, 1907, vol. xlviii. p. 1400, No. 17) recommends the application of acetone. As much as possible of the cancerous tissue is scraped away, and the surface dried with cotton-wool. With the patient in the Trendelenburg position, from a half to one ounce is poured on the wound through a Fergusson's speculum and allowed to act on the tissues for about half an hour. The surrounding parts must be protected. The discharge becomes less offensive, the bleeding diminishes, and the growth itself becomes less friable. In none of the cases so treated was acetone detected in the urine.

BACKWARD DISPLACEMENTS OF THE UTERUS.

BELLINGHAM SMITH (*Practitioner*, London, 1907, August), in writing on this subject, gives the following summary:—(1) Many cases of backward displacement are unattended by symptoms, and need no treatment. (2) Some are congenital, and have symptoms that are not referable to the displacement, namely, dysmenorrhœa and sterility. These call for a different line of treatment. (3) Where enlargement and tenderness of the uterine body exists, and there is a difficulty in immediate replacement, treatment with a view to reducing congestion should be carried out. The same preparatory treatment should apply to those cases in which the ovaries are prolapsed. (4) When well-marked symptoms of neurosis are present, it is advisable to consider carefully how far the local condition is responsible for them. (5) When the uterus is bound down by adhesions, persistence of symptoms in spite of treatment will justify an operation for the freeing of adhesions and fixation forward of the uterus. (6) Ventral and other methods of fixation of the uterus are called for in a small minority of cases of backward displacement. Owing to the risks involved in the operation itself and from subsequent pregnancy, it should be undertaken only when other measures of relief have failed.

VENTRAL FIXATION OF THE UTERUS AS A CAUSE OF DYSTOCIA.

P. H. INGALLS (*Am. Journ. Obst.*, N.Y., 1907, May) reports three cases of dystocia from this cause, and protests against fixation operations in women of child-bearing age. In the first case version was with difficulty performed. The infant was hydrocephalic, and the uterus ruptured through the posterior wall. Hysterectomy was performed, and the patient recovered. At the operation the fundus was found fixed to the anterior abdominal wall. The anterior uterine wall was much thickened, and the posterior wall, which had ruptured, was very thin. In the second case Cæsarean section was performed after labour had been in progress for some hours, and in this case also the posterior uterine wall had ruptured. In the third case the child was extracted with great difficulty after podalic version. The abdomen was subsequently opened, adhesions to the anterior abdominal wall divided, and the round ligaments brought together behind the uterus.

FIBROID TUMOURS OF THE UTERUS IN PREGNANCY, LABOUR, AND THE PUERPERAL STATE.

MATHEW D. MANN (*Am. Journ. Obst.*, N.Y., 1907, June) gives statistics bearing on the frequency of cases of fibroids complicated by pregnancy. Reference is made to the difficulty of diagnosis in the early months, and to the comparative frequency of ectopic pregnancy in association with fibroids. Noble collected 2274 cases of fibroids, in nineteen of which pregnancy occurred. In six of the nineteen cases the pregnancy was ectopic. When abortion occurs, it is probable that the placenta is implanted on the fibroid, and in those cases the patient's life may be endangered by sepsis or severe hæmorrhage. When considering the treatment, Mann mentions that Stratz treated sixty-eight cases, and in only one was operative interference necessary. Seventeen aborted, but the remaining fifty patients had easy labours, and all the children lived. If, however, the tumour proves to be an absolute obstruction to labour, then operation becomes imperative. When possible myomectomy should be performed. The author has had three cases in which large tumours were removed from the uterine wall at the fourth, fifth, and sixth months, and in all the pregnancy continued to term.

Abdominal Colpopexy for Prolapsus Uteri.

Jacobs (*Med. Press and Circ.*, London, 1907, April, p. 449) recommends this operation in the severest forms of uterine prolapse. The uterus and appendages are removed along with a portion of the vagina, and the latter is then fixed to the ligamentary stumps. The results in seventy-five cases have all been favourable.

The Operative Treatment of Chronic Inflammatory Diseases of the Tubes and Ovaries by Abdominal Section.

Esch (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, 1907, Bd. lix. Heft 1) states that in Olshausen's klinik operation on pyosalpinx is, if possible, deferred till about nine months after the occurrence of infection, and when the temperature is normal. The rate of mortality in 142 cases was 4·2 per cent. As far as possible all stumps were covered with peritoneum, so as to avoid the subsequent occurrence of ileus. If a pus sac ruptures during operation, great importance is put upon securing absolute dryness of the peritoneal cavity. If all oozing is arrested, no drainage or irrigation of the abdomen is necessary. Esch regards the pus contained in ovarian abscesses as being highly virulent, and the presence of a fistulous opening into the rectum of grave prognosis.

THERAPEUTICS.

UNDER THE CHARGE OF

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On the Treatment of some Cases of Serious Heart Disease.

In a short paper in *Folia Therap.*, London (1907, July), Morison advocates a bold treatment of serious heart conditions. There are certain cases in which the myocardium has lost its contractility (whether purely from muscular, or from hæmic, or from neural causes), in which the only hope lies in a wise and calculated boldness of the physician. Thus, in the dilated and exhausted heart of a comparatively young person, suffering from serious valvular incompetency, failure may either be gradual, with dropsy and venous engorgement, or, without such general statis, the ventricular action may suddenly pause in the diastolic phase, with sudden, unexpectedly fatal result. In the first form it is necessary to remove accumulations of serum and blood by puncture or venesection, and to use boldly a cardiac remedy until a definite result is obtained. To do this, 15·25 minims of the tincture of digitalis or strophanthus, either alone or in combination, should be used every four hours till definite retardation of the heart is obtained, and only then the hold of the drug upon the heart may be relaxed gradually. For such purpose the tinctures are as suitable as any of the newer preparations of the active principles. In the second class of serious syncopal failure without marked venous engorgement, while the digitalis body should be pushed cautiously till a physiological effect is produced, it is well to combine with the digitalis some strychnine and belladonna. Such cases frequently die suddenly without any treatment. Consequently, if treatment is instituted and sudden death occurs, we are too apt to ascribe this fatality to the use of the drug. The only chance, nevertheless, lies in the fearless attempt to restore the lost contractility of the cardiac muscle by free use of the remedies mentioned. In a further suggestion, Morison foreshadows the day when the aid of the surgeon will be called in to help medical treatment. He considers that in many cases drug treatment cannot alone cure, where there is an adhesion to the lung or ribs impeding the contraction of the heart. Similarly, the mere enlargement of the heart may so encroach upon the intrathoracic space that the respiratory capacity of the lungs is seriously diminished. Under these conditions we witness failure after failure with drug treatment. Morison thinks that we shall continue to do so till the heart is afforded more room by the separation of adhesions, or sufficient rib and cartilage in the præcordia is removed to give the enlarged heart room.

THE USE OF ALCOHOL INJECTIONS IN NEURALGIA.

THE local injection of diluted alcohol in the treatment of sciatica and neuralgia has been warmly advocated by Schlösser. Though undoubtedly highly effectual, in certain cases it is not without serious disadvantages. Fischler tested the drug in a series of cases of sciatica. In several of his cases the immediate relief obtained was very marked, but in his twelfth case he had the misfortune to bring on a severe paralysis in the peroneal nerve. The injection consisted of 1 c.c. of 70 per cent. alcohol, and caused no particular pain. Next morning, however, he found that the muscles supplied by the nerve were all paralysed. There was a complete reaction of degeneration in the paralysed muscles, and this condition persisted for over six months. At the end of nine months the patient began to walk again, but the electrical alterations did not pass off completely for another three months. In view of this unfortunate experience, Fischler stopped the use of the alcohol in sciatica. He has been able to obtain from Professor Erb records of three similar cases, in which the local injection of alcohol was followed by paralysis. In view of the fact that the local injection of alcohol is often strikingly successful, he hopes that some improvement in technique will be discovered, which will prevent the development of such toxic paralysis. Meantime he advises that the alcohol treatment shall not be used in treating neuralgia of a mixed motor and sensory nerve, but be reserved for neuralgias in purely sensory nerves, such as the supra-orbital and infra-orbitral nerves.—*München. med. Wchnschr.*, 1907, No. 32.

Carbolic Acid.

Seel describes a number of double salts of phenol formed by combining three molecules of phenol with one of phenolate of potassium. Similar salts form with meta- and para-cresols. These salts give fine crystalline products of much higher melting points than the cresols and phenol. They are soluble in water, forming clear solutions with distilled water. They can readily be made into convenient tabloid form with or without the addition of a small quantity of soap. These preparations are not new substances, but depend for their action upon the phenol and cresol which they contain, and they all act as useful disinfecting and antiseptic bodies. The double salt of potassium para-cresol and para-cresol is put upon the market under the name of paralysol. Its activity is represented by the fact that two tablets of paralysol of 15 grs. each correspond to 3 c.c. of lysol. It is hoped that in the form of soluble tabloids these new combinations will come into use, as they are more easy to carry about, and there is less chance of making a mistake in preparing solutions for use by patients and untrained people.—*München. med. Wchnschr.*, 1907, No. 31.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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A Fatal Case of Poisoning by Corrosive Sublimate.

Halipié (*Rev. de méd. lég.*, Paris, 1907, No. 4) records a case which is of interest owing to the length of time the patient survived, and from the fact that after death the presence of mercury was detected in the principal viscera. A woman, æt. 30, was brought to hospital with the history of having taken an aqueous solution of corrosive sublimate, which had been prepared for the purpose of vaginal injection during her confinement three months previously. A quarter of an hour after taking the solution, by means of an emetic a great proportion of the liquid was vomited. Vomiting persisted, and the symptoms presented three phases. The first or initial phase lasted nine days, and was characterised by vomiting, diarrhœa, and stomatitis. There was almost absolute anuria with albuminuria. The intermediate phase was liable to give rise to false hopes of recovery. The gastro-intestinal symptoms ceased, the quantity of urine passed increased to three-quarters of a litre a day; the patient was able to take a little food. This phase lasted for four days, and was succeeded by the third, in which the acute gastro-intestinal symptoms returned, the stools contained blood, the urine passed diminished in quantity. There was profound anæmia and general depression, and the tremblings of the upper limbs, which is so characteristic of mercurialism, appeared. Death occurred on the twenty-fifth day. On analysis of the viscera, weighable quantities of mercury were found in the liver and in both kidneys, while traces were also found in the small intestine and brain.

A COMPARISON OF THE TOXICITY OF CHINOSOL, LYSOL, AND KRESOL.

WEYL (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1907, Heft 3) has carried out a series of experiments upon animals in order to determine the toxicity of chinosol as compared with lysol and kresol. All three substances represent phenols, in the case of lysol, phenol in a soap solution. Chinosol is a combination of oxychinolin with bisulphate of potassium, but the combination is so unstable that washing with ether decomposes it into its two constituents. The experiments which were made upon rabbits by intra-abdominal and subcutaneous injection, as well as by introduction into the stomach, indicate great differences in the toxicity of the three substances, according to the manner of administration. The smallest fatal dose was proportionately, after introduction into the stomach—kresol, 1·99; chinosol, 4·46; and lysol, 5. By subcutaneous administration—chinosol, 0·7; lysol, 1·4; and kresol, 3·3. While by intra-abdominal administration the amounts were—lysol, 0·33; chinosol and kresol, 0·5. Chinosol in the case of rabbits is as poisonous, if not even more so, than lysol when absorbed from the stomach, while by subcutaneous injection it is 100 per cent. more poisonous than lysol, although it is much less toxic in its effects when introduced into the peritoneum. The practical conclusion to be derived from the investigation is, that chinosol is an exceedingly poisonous substance, notwithstanding pretensions to the contrary, and that its sale therefore ought to be placed under the same restrictions as in the case of lysol and carbolic acid.

THE SPECTROSCOPIC DETECTION OF CO IN BLOOD.

KURPJUWEIT (*Vrtljschr. f. gerichtl Med.*, Berlin, 1907, Heft 3) draws attention to a method by which CO can be detected by means of the spectroscope in blood when present in a proportion of not less than 15·75 per cent. Kreis places the limit of its recognition by the spectroscope at 49 per cent., while Welzel places it at 26·5–28 per cent. Kurpjuweit finds that if CO blood be reduced by means of Stokes' fluid and the amount of CO present be not sufficient to give the two characteristic bands, yet that the single broad band of reduced Hb undergoes a displacement towards the violet end of the spectrum, and moreover shows a darker and more sharply defined shadow in the middle, if CO is present to the extent of not less than 15·75 per cent. He is therefore of opinion that this displacement of the band of reduced Hb towards the right, which is easily verified and which he has constantly observed, constitutes a means of detecting spectroscopically a smaller percentage of CO in blood than has been so far attained.

A New Method of Identification superseding Dactyloscopy.

Prager (*Med. Rec.*, N.Y., 1907, June 29) is of opinion that dactyloscopy as a means of identification suffers from drawbacks which are due partly to the ready changeability of the epidermis of the fingers and partly to the difficulty encountered and the large amount of experience necessary in correctly reading dactylograms. He has for many years examined the impressions made by human jaws, and he finds that the impression made by the upper jaw of each and every individual is distinctive and characteristic. "Not two impressions among thousands are alike in regard to the number, length, and breadth of the teeth and the curvature and radius of the maxillary arch. The height, breadth, and depth of the upper jaw present equally many striking and readily recognised differences. There are so many distinctive features in every jaw, that even though one or more be obliterated by time through pathological changes, there will always remain a sufficient number of ineffaceable characteristics to render absolute identification possible. To take the impression is a very simple matter. Every physician can attend to it, and every layman can readily learn the manipulation."

The Micro-Chemical Reactions of Seminal Fluid.

Bokarius (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1907, Heft 2) concludes, from experiments in which, after adding platinum chloride to seminal fluid, he estimated the quantity of platinum present, and found it to correspond with the amount contained in cholin-platinum chloride, that the substance which produces Florence's crystals is really cholin. He finds further that human semen is more sensitive to iodine solutions than other substances which give the Florence reaction, but he is of opinion that it is impossible to form a conclusive judgment from the reaction, and that even as a preliminary test for semen, it should only be employed with great caution. As regards Barberio's reaction, he supports the views which have been expressed by others, that typical crystals with picric acid are only obtained from human semen. To overcome the failure of the reaction which sometimes occurs owing to excess of the reagent or too great dilution of the fluid to be tested, he recommends the following modifications of the reagent employed:—

Sol. acid. picronitrici aquos. concent.	25·0 grms.
Cadmii iodati	3·0 ,,
Gummi Arabici	2·0 ,,

Or,

Acidi acetici glacialis	pp. ana.
Aquæ destill.	
Ac. picronitrici	q.s. ad saturationem ;

both of which give good results.

A Prolonged Fast.

Cases of fasting when properly authenticated and observed have considerable medico-legal interest, and in the present instance both of these conditions were fulfilled. The observations made are in many respects remarkable, and for full details the paper should be consulted. Mr.

Martin, a student, undertook the fast voluntarily. It began on 27th December 1906 at 9 a.m., when he partook of the last meal, which consisted of a little oatmeal, milk, and two egg sandwiches, and was concluded on 5th January at 6 p.m., when he first took nourishment again. From 5 p.m. on the first day, when he took a teaspoonful of charcoal, to act as an indicator, until 6 p.m. on the last day, or, in other words a period of nine days, he took absolutely no nourishment whatever in any shape or form, though he drank freely of what water he desired. During the nine days, six litres of water were thus partaken of, or an average of about three ordinary tumblerfuls a day. His weight dropped from 140·2 lb. at the beginning of the fast to 125·9 lb. at its conclusion, making a total loss of 14·2 lb., or an average of 1·57 lb. a day. At the end of the first week after the fast his weight was 139·6 lb., at the end of the second week 136·7 lb., while at the end of the third week it was 138 lb. To regain his weight he did not eat excessively, but drank a good deal of water. The psychical or mental effects of the fast are best given in the author's own words:

"My hunger and appetite, needless to say, were ever present with me. I would make the following distinction between the two:—Hunger is the craving sensation occasioned by the want of food, while appetite is merely the desire, normal or otherwise, to partake of food. My hunger began to show itself on the evening of the first day. Next morning, or twenty-four hours after food, it was distinctly well marked, and just how marked I presume that most of you know, having experienced as much at some period or other of your life. If you can just imagine this to continue over eight or nine days, you will have a fairly good idea of what my hunger was. With the exception of a slight gnawing sensation experienced for a short time on the fourth day, it did neither increase nor abate from the second day onward. However, let me not give you the impression that it was unbearable. It was not. On the contrary, so long as my mind was occupied with something else, even simple matters such as reading the newspapers or walking in the streets, etc., I would be wholly unconscious of it; but let it be unoccupied even for a moment, then this sensation would be dwelt upon and magnified; with my appetite it was somewhat different. It gradually although very slowly increased in intensity from the very beginning. Why was this, considering that my hunger did not increase likewise? I can but suggest an explanation. We all know that there is a peculiar pleasure in taking food, particularly when it is taken under normal conditions. Being continuously cut off as I was from this pleasure, there was an ever-increasing effect of this privation upon me as time went on, leading to a gradual intensifying of my appetite." During the fast he slept well, but found that he gradually required a longer period of rest. He became much weakened, but his strength held out well, considering that he walked on an average five miles a day, and also underwent a series of daily physical exercises. No marked weakness appeared until the third day, and on the ninth day he thought there was some improvement in strength, and that he moved about with less fatigue. He suffered no ill-effects, indeed he states that both physically and mentally he never was on a higher plane than during the first few weeks after his self-imposed task.—*Montreal Med. Journ.*, 1907, July.

DERMATOLOGY.

UNDER THE CHARGE OF

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Senile Angioma of the Lip.

Pasini (*Monatsh. f. prakt. Dermat.*, Hamburg, 1907, March 15 and April 1) draws attention to this not uncommon condition, which, however, seems hitherto to have escaped notice. It consists of an angiomatous formation, appearing in the elderly, and having its situation in the thick part of the free portion of the under lip, and there connected with the peculiar distribution of the blood vessels. Many persons must have observed, without perhaps thinking anything about it, a blackish purple elevated mark on the under lip of old people, in shape and colour not unlike half a black currant berry. Pasini has collected notes of fifty cases, and in forty-eight the growth was on the lower lip, in one of these on the mucous surface, in the remaining two on the upper lip. There is, as a rule, only one tumour. It begins usually between the ages of 50 and 60, and more frequently in women than in men, by the appearance of one or more small bluish spots beneath the epidermis, of the size of a pinhead. These slowly increase in size, and in course of weeks or months become combined into a hemispherical enlargement. This when it reaches its full development remains unaltered for an indefinite period. The surface is smooth but undulating, with no indication of hyperkeratosis. Owing to its intense cyanotic colour, it is sharply defined against the red tint of the lip. The colour of the growth is not quite uniform, diminishing and passing into grey at the edges. The hue fades somewhat but does not disappear under the diascope. There is no pain either spontaneously or on pressure, and it causes neither general nor local uneasiness, nor is it associated with any other disturbance of the circulatory apparatus. Although no constant or distinctive ailment is encountered in those affected, still the individuals who exhibit it are, as a rule, weakly, and have never apparently been in the enjoyment of thoroughly robust health. The commencement is insidious, so no direct cause can be assigned, but Pasini thinks that some trauma may be the starting-point, since the tumour generally appears on that part of the lip border most exposed to the action of irritants from without, during the introduction of food. The vascular elements of the normal lip lend themselves readily to this angiomatous change, as the veins in the papillæ form lacunar dilatations which freely intercommunicate. These lie parallel to the surface, and are more marked in the lower than in the upper lip. In those up in years the connective tissue meshwork lessens in amount, and the elastin undergoes degenerative changes. The angioma is brought about by excessive enlargement of one or more of the veins which course through the deeper part of the lip margin. The deep colour is occasioned by thinning of the walls, and retardation of the blood stream. It is to be regarded as an alteration affecting specially those whose general health is greatly reduced and run down, and is to be looked on as a symptom of rapidly advancing involution of the organism. In its nature it is a dilatation of one or more veins, caused by the disappearance of the elastic element in their walls, by degeneration and atrophy of the surrounding and supporting tissues, and by an increase in local blood pressure. It should have a prominent place among the varicosities affecting the skin.

THE HYPODERMIC SPOROTRICHOSES.

BEURMANN and Gougerot (*Ann. de dermat. et de syph.*, Paris, 1906, October, November, December) direct attention to this recently isolated class of fungi. These have a place in morphology close to the blastomyces, and give rise to the production of subcutaneous nodosities and abscesses. So far three varieties have been described—the *Sporotrichum Beurmanni*, the *S. Dori*, and the *S. Schenkii*. In the first of these neither the mode of entrance, the place, nor the source of contagion have been discovered. Three patients attacked were æt. 42, 62, and 37 respectively. Their occupations were wholly different. Though the general health appeared good, there were debilitating circumstances, which perhaps favoured infection,—tuberculosis, premature senility, gout. The commencement was in all insidious and progressive. Within three to four weeks multiple subcutaneous nodosities manifested themselves in succession, scattered over the whole body, without arrangement or elective localisation. Each element evolved separately and rapidly, attained its definite size, and terminated in abscess in four to six weeks. In the first stage the nodosity was small, hard, elastic, mobile, and painless, perceptible only on palpation. The skin was not adherent, and retained its normal colour. The sensation conveyed on feeling it was that of a cherry-stone embedded in the hypoderm. Enlarging by degrees, they formed adhesions to the integument, which looked wrinkled or punctated like the rind of an orange, and was coloured purplish or brownish-red. If not attended to, the second stage was reached, progress was made toward softening, and the formation of a characteristic abscess. This had no tendency to rupture, or to break down into an ulcer. If incised, however, in error, a viscous fluid was evacuated, and an ulcer with a granular floor followed. Inoculated on a medium, a pure culture of the *S. Beurmanni* resulted. Untreated, the disease tends to chronicity, the gummata and abscesses multiplying in number. Other conditions, liable to be confused, are cysticerci, syphilitic and tuberculous gummata, also the subcutaneous sarcoid of Darier-Roussy. Cultures produce long mycelial threads, branching at right angles, and having grape-like bunches of spores, commonly arranged terminally. Under high powers, the structure of the spores is peculiar, showing chromatine contents, or a substance allied to chromatine, assuming nuclei-like forms. Some have vacuoles, others exhibit karyokinetic figures. Inoculations into animals were not conspicuously successful. The second type, that of Dor, gives rise to larger abscesses, diffused without order, but mostly subcutaneous. There is a strange contrast between the profusion of the lesions, their size, and the simplicity of the cure. The parasite present is related to, but distinct from, the previous one. The description of the third type rests on observations of American authors. It involves the lymphytic system, has an exact point of introduction, and persists under the form of an ulcer requiring months to cicatrise. In from one to three months, after a traumatism to a finger, a small "cold" abscess develops at the place of inoculation, and ruptures. Some days or weeks subsequently, higher up in the limb, a hard, round lump supervenes, which in turn softens and ulcerates, followed in succession by others nearer and nearer the centre, and pursuing the line of the lymphatic trunks. These nodosities have the same characters as those of the first type, but spontaneous ulceration is almost constant. Along the limb are a series of gummata in different stages of development, and between them the swollen lymphatic trunk, rolling under the finger, and covered by healthy skin. The *S. Schenkii* forms long septate filaments, with granular protoplasm and few collateral branches. The spores are oval, and attached by a thread to the mycelium. The specific treatment is by iodide of potassium, in doses of 30 to 60 grains daily. The cure is, as a rule, rapid, but the drug should be continued for some days after disappearance of the nodosities, to obviate relapses.

Gaucher (*Gaz. d. hôp.*, Paris, 1907, June 13) has a lecture on the same subject, in which he adds some additional facts. The extension of the disease from the primary, hard, indolent nodule is at first slow, but successive foci may in course of some months appear simultaneously in different localities. A circumstance of diagnostic importance is that there does not arise the least ganglionic enlargement, which helps to eliminate syphilis. The abscesses may attain considerable dimensions before they manifest any tendency to rupture, in one of his cases reaching even the size of the fist. The ulcers, too, may be extensive, and round their secreting and crusted area small yellow blisters may form, isolated or in groups. Or in some cases there are circles with a rose-coloured border and a centre resembling mother-of-pearl, reminding one somewhat of trichophytosis. This represents the epidermic type. The contents of the vesicles give pure cultures of the *S. Beurmanni.* The sputum likewise of one patient furnished a mixed culture of tubercle bacilli and sporotrix, proving visceral infection. Besides the internal administration of iodide of potassium, it may be applied locally in solution, and the combination seems to accelerate the curative action.

MOLLUSCUM FIBROSUM AND NEURO-FIBROMATOSIS.

THREE authors, Finch Noyes (*Internat. Med. Journ. Austral.*, Melbourne 1905, August 20) and Malcolm Morris and Fox (*Brit. Journ. Dermat.*, London, 1907, April) have taken up this subject, and recorded and investigated some cases. The peculiar multiple, sessile, pedunculated or pouch-like tumours are too well known to need detailed description, but there are some accessory features less recognised. One of these is the colour, which, while it may not differ from that of the surrounding skin, is sometimes bluish, purplish, or pink in hue. Another is that the sensibility of the skin over the new growths may be much modified.

There may be marked diminution of sensibility to contact, puncture, or heat and cold. In Morris's case there were intense itching and pricking sensations, the pedunculated causing more itching, while the sessile were rather tender and painful. In one of Finch Noyes' cases there were patches of dark brown pigment on the back, but in Morris's case there was none, only motley staining at the root of the neck and between the scapulæ. From microscopic examination of all the cases it seems distinctly shown that the origin of the tumours is closely connected with branches of the cutaneous nerves by proliferation of the endoneurium. In Morris's case only fine fibrils in the skin were attacked, which may partly explain the pruritus. The bluish tinge, Finch Noyes thinks, may be due to involvement of the vasomotor mechanism by the new growth.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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On the Use of Living Lactic Acid Bacilli to combat Intestinal Fermentation in Infancy.

Writing on this subject (*Arch. Pediat.*, N.Y., 1907, April), Dr. Hunter Dunn draws a distinction between infectious diarrhœa and intestinal indigestion of the fermentation type. He maintains that much confusion in classification has resulted from the failure to distinguish between a process caused by a parasite infecting and living upon the tissues of the body, and a process caused by a saprophyte living upon the intestinal contents. The writer believes that this distinction is in most cases represented by a clinical parallel, and that a diagnosis between the two conditions can be made upon clinical grounds. The former is characterised by persistent fever and the early appearance of the signs of ileo-colitis, viz. mucus and blood in the discharges. The latter is characterised by the absence or brief duration of fever, and by the signs of excessive fermentation in the discharges, viz. a green colour and foul odour, with signs of ileo-colitis only after prolonged illness, if at all. Tissier in an article on "The Treatment of Infantile Intestinal Infection" (*Ann. de l'Inst. Pasteur*, Paris, No. 5, tome xix.) suggested the possibility of specific therapy for the fermental cases which would make their sharp differentiation from the infectious cases all the more useful. The subject was approached by Tissier from the point of the organisms causing fermentation in the intestinal contents. He made careful studies of the intestinal flora in health and disease, and found that in health the *Bacillus bifida* is the predominating organism of the dejecta in overwhelming preponderance. In disease a transformation takes place, the *B. bifidus* disappears, and a number of abnormal forms appear. Amongst them there is only one which is pathogenic towards animals, and which attacks proteid substances and their derivatives. In doing this it forms a toxin which has some necrotic power on the tissues. This organism is the *B. perfringens*, a large rod with square ends which stains with Gram's method. In early stages it has a spore at one end but later no spores are seen. Tissier believes this organism to be the cause of the class of cases known as fermental diarrhœa. The products of fermentation caused by other organisms he regards as having a possible contributive action through irritation of the mucosa. He further noticed that in recovery a very rapid change occurred in the bacteria of the discharges. The abnormal forms disappear and the *B. bifidus* reappears, at first in its bifurcated form, and quickly resumes its place as the preponderating micro-organism. Tissier concludes that the indications for treatment are to remove the fermenting intestinal contents by purgation and water diet, and to cause a reappearance of the normal intestinal flora. This object, he believes, can be specifically attained by introducing into the intestine an organism tending to inhibit the growth of abnormal forms and to finally overcome and cause their disappearance.

In searching for a suitable organism for this latter purpose, he found that the *B. bifidus* and the lactic acid bacillus both stop the development of the *perfringens*, and he selected the lactic acid bacillus as it is more easily cultivated and handled. He uses this organism to affect a transformation of the intestinal flora. In cases of fermental diarrhœa Tissier gives his patients pure cultures of lactic acid bacillus, and under this treatment he notes a rapid transformation of the stools, subsidence of the symptoms, and gain in weight. Although it has for long been recognised that the growth of one organism inhibits the growth of another, Tissier's specific method of treating these cases of fermental diarrhœa marks a distinct advance in the management of these troublesome cases, as it has never previously been attempted to stop intestinal fermentation by introducing an inhibitory organism into the intestine.

Dunn, in discussing Tissier's conclusions, submits that whether the processes are caused by the *B. perfringens* or not does not affect the main issue. Allowing that these intestinal fermentations are caused by bacteria, he maintains that we are justified in introducing into the intestine any harmless organism that affects a hope of inhibiting the abnormal processes. The lactic acid bacillus is harmless, and as it inhibits the *B. perfringens*, it at least holds forth a prospect of good results. He selected buttermilk as a convenient vehicle for giving lactic acid bacilli, in the first place because it seemed that by combining a medicine and a food larger numbers of the organism could be introduced than if smaller doses of bouillon cultures were used in addition to the food. In the second place, wishing to use a constant food, buttermilk was selected as being a digestible food not liable to produce accidental upsets from proteid or fat intolerance.

The milk is first Pasteurised and then inoculated with a pure culture of lactic acid bacillus, and ripened until the development of the organism has brought about the proper acidity and precipitation of the casein. Thirty-five selected cases were subjected to this treatment, and the results proved very striking. In twenty-three cases there was evidence of a favourable result, as shown by a change in the character of the dejecta and by gain in weight. In three of the others there was immediate cessation of the diarrhœa and favourable changes in the dejecta, without gain in weight. In nine cases no effect was produced. In most of the cases the buttermilk was begun only after all the ordinary methods of treatment had failed, and the author had endeavoured as far as possible to select for experiment only the most obstinate and resistant cases, so that the results of his treatment are very convincing. Five of the thirty-five cases belonged to the irritative non-fermental type, and the treatment in each of them was absolutely futile, which is further evidence in favour of the specificity of the method of treatment. Two of the series were of the dysenteric type, characterised by persistent fever and stools containing blood and mucus. In both of them also the buttermilk failed to bring about any notable change. Thus only two of the cases of failure were of the fermental type of the disease, for which this method of specific treatment is prescribed by Tissier. In order to justify the conclusion that the favourable results gained were due to the action of the living lactic acid bacilli, it was necessary to obtain evidence that they were not due to chemical qualities of the buttermilk as a food. To investigate this, fourteen of the fermental cases were first given buttermilk in a Pasteurised form, and after a sufficient trial had demonstrated a failure to improve, the Pasteurisation was simply omitted, no other change being made. In every one of the cases the omitting of the Pasteurisation was followed by immediate improvement.

In some of the cases recorded, although the employment of buttermilk was followed by improvement of the symptoms and cessation of diarrhœa, no gain in weight followed. This seemed to suggest that although the lactic acid bacilli had stopped the fermentation, the buttermilk was not adapted to the caloric needs of the child. When the buttermilk was supplemented with food of a higher caloric value, the child gained in weight. Moro (*München. med. Wchnschr.*, 1906, No. 41, Bd. liii.) records his experiences of the methods recommended by Tissier. He found it was necessary to use large quantities of bouillon culture of lactic acid by the mouth, and he thinks the results are better when the organism is introduced into the rectum. Dunn concludes a very interesting and instructive paper by giving the records in detail of his thirty-five cases. He does not claim that his results are conclusive, or that they prove the value of lactic acid bacilli against all cases of intestinal fermentation, as he considers the number of patients he has treated as too small to justify him in drawing absolute conclusions. The only conclusion which he believes may safely be drawn is that the use of living lactic acid bacilli is a harmless method of treatment, and that it may do good in cases of intestinal fermentation. He considers that it is an additional resource applicable in a very difficult class of cases, and that it has a logical scientific foundation, which in time may take a high place in the scale of efficiency.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Drink Problem. THE medico-sociological aspects of the Drink Problem are clearly discussed in this volume.[1] It is no isolated problem to be settled once and for ever by any bold stroke of legislation, but perhaps the most difficult and complex task that lies before mankind in the gradual struggle onwards towards better things. How much better the world would be without alcohol, it is impossible to say, but unquestionably its use and abuse are bound up intimately with many of the ills to which the flesh is heir, and are responsible for much of the personal and social degradation and national inefficiency, which the most casual observer can see everywhere. How to get rid of this self-imposed yoke is a problem which in its entirety may never be solved, but the temperance movement is one which we are fain to believe is even now occupying the attention of a large and ever-growing number of earnest-minded persons, and one in which the medical profession as a whole ought to take a more active and leading part. From his education and training, the medical man should be in a better position than most to appreciate the extraordinary complexity of the problem and the need for thorough scientific investigation thereof in all its many bearings; while in his daily practice he can, if true to his best ideals, exercise a potent influence for good in many quiet and unobtrusive ways besides actively helping individual cases. Sociologically the problem is as many-sided as is modern life, and the remedies must needs be equally varied. Wise legislation is required on the principle of eliminating private profit from the retailing of intoxicating liquors, and the public must be educated up to a better understanding of the dangers of even "moderate drinking." Pending the arrival of this millennium, any movement which will be a definite counter-attraction to the public house must be welcomed with approval; and one such has recently been initiated in Edinburgh. Individually, the Scottish people—speaking generally—have outgrown, for better or for worse, the narrow Calvinism of their forefathers, but the old ideas still dominate many of their habits collectively. Thus it would appear to be assumed that after 6 or 7 p.m., everyone had a comfortable home to remain at and wished to remain there—a highly fallacious assumption, so far as a great part of our urban population is concerned, for what do we see—crowds of both sexes roaming the streets with nothing to do and nowhere to go. Only "The Trade" seems to have met the very real wish and need for social intercourse during the evening hours, for look then where you will, there is scarcely a single place open, and still fewer that can be called attractive, except "licensed premises," whose main object is, after all, to sell as much alcoholic liquor as they can for the proprietor's personal profit. But under the circumstances it cannot be wondered at that they are well patronised. Some place after the style of the Continental Cafés, but non-licensed, is required where men and women can meet, and this is what the New Popular Café Co. Ltd. are aiming at supplying in the premises recently opened in the North Bridge. The rooms are large and comfortable, the refreshments are of first-class quality and moderate in price, good music is provided, and also billiards and other facilities for recreation; smoking is permitted after 6 p.m., and they remain open till 10 o'clock. That the venture will be a success there can be little doubt, for the numbers to which such facilities must appeal are large, and already crowds have been turned away from the doors. We have no log to roll in recommending the project and wishing the Company every success in its good work, for although the venture is being run on strictly commercial lines, the Directors have, following the lead of the Norwegian Samlags, voluntarily limited their possible return to 5 per cent. per annum, any profits that may be gained beyond this going towards extending the Company's operations in their fight for Temperance.

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[1] "The Drink Problem," edited by T. N. Kelynack, M.D. London: Methuen & Co.

The Territorial Army Scheme.

Now that the Territorial and Reserve Forces Act has become law, we are glad to see that no time is being lost in taking steps to carry out its provisions. Many may be doubtful whether this latest endeavour to place the country in a position to defend itself in case of invasion goes as far as it ought to do, and whether Mr. Haldane was wise to refrain from asking for some system of universal compulsory military training. So far as the medical profession is concerned, we believe that such a scheme would receive hearty support.

The Territorial Army is not going to make such a great demand upon medical men, but still it requires an efficient medical service, and we congratulate Sir Alfred Keogh, the Director-General of the Army Medical Service, upon the admirable tact he has shown in bringing his requirements before the profession in Scotland.

At a meeting convened by Professor D. J. Cunningham, the

Director-General explained to a representative gathering of medical men in Edinburgh the scope and objects of Mr. Haldane's Act. He stated that what was required was an efficient staff of physicians, surgeons, and sanitary officers, who in case of need would be willing to place their services at the disposal of Government in connection with any hospital which might be formed in the Edinburgh district.

Such a contingency would arise if the country was invaded, but apart from this no call would be made upon the services of those who undertook the proposed duty. The meeting was greatly impressed with the lucid and forcible manner in which Sir Alfred Keogh explained the scheme, and unanimously expressed approval of the general proposal. A Committee was appointed, with Mr. J. W. B. Hodsdon, F.R.C.S., and Dr. Edwin Bramwell, as secretaries, to advise the Director-General as to the best method of selecting any officers that may be required; and the meeting ended with a hearty vote of thanks to Sir Alfred Keogh for the manner in which he had brought the scheme forward.

A similar meeting, under the presidency of the Lord Provost of Glasgow, as Lord-Lieutenant, was subsequently held in Glasgow, and expressed itself equally favourable to the scheme. We understand that the medical profession of Aberdeen and Dundee have been approached in the same manner, and that, so far as Scotland is concerned, the Director-General feels that he carries back with him the support and best wishes of the profession.

Fourteenth International Congress of Hygiene and Demography.

This great Congress was held from the 23rd to the 29th of September. And when they hold a Congress in Germany, they do it in all seriousness. To begin with, the executive had secured the Reichstag Buildings for all the meetings. This magnificent romanesque structure lent itself to the purpose as if it had been specially erected for no other. We can scarcely imagine any Congress on hygiene or anything else meeting in the many rooms of our own Houses of Parliament. Who would dare to suggest that the outer lobby should be devoted to an exhibit of tropical diseases, or the inner lobby to a display of sewage purification models, or the side corridors to the pathology of infants and the ways of stopping their death? The sacred history of our Houses of Parliament forbid any such suggestion. But the history of the Reichstag and of its local habitation is short, and one has no sense of incongruity in seeing the great rooms devoted to the major exhibits, the side-rooms to the special stalls, the committee-rooms to the sectional meetings, and the great meeting-room to the general gatherings of the Congress. The use was worthy of the building, and it is a sign of the seriousness of the

German mind that it should devote the whole of its splendid Imperial Building to the greatest movement of the time.

In numbers the Congress was, we should imagine, a record. It was said that some 4500 members had been enrolled. If there be any doubt, it is easy enough to count the names. Anyhow, there were men and women enough to make a real difference to the day's life of Berlin,—its restaurants, its hotels, its theatres, its concert halls, its hygienic institutions, its hospitals, its schools, and the private houses of the wealthy. Prince Carolath did his duty faithfully as the President. The social side of the Congress was developed in a whole-hearted style in space, time, and quantity of eatables and drinkables,—a style essentially German in its warm-heartedness and profusion. There was a big introductory Reception on the opening Sunday. There was a Reception at the Rathaus on Tuesday, a sumptuous Congress Dinner on Wednesday, gala representations at the Opera House and Theatres on Thursday, some long excursions and a restaurant evening on Friday, two or three open-air concerts, receptions at private clubs, and unending private hospitality.

On the last day, there was a special Reception at the British Embassy for the British Delegates, who were a very considerable number. Count de Salis, secretary to the Legation, represented Britain officially, and for his courtesy and attention to the British delegates more than deserved all the kind things said of him. Arrangements were made for group visits to all the leading institutions of Berlin, and were fully used. The Ladies' Committee did wonders, and their hospitality was the talk of everybody.

Of the professional side of the Congress there is not much of a sensational kind to record. There was no great announcement either of fact or of fiction. There was no titanic combat over new discoveries. In every department it was spade-work, but the spade-work in every section was good. The Transactions will contain many valuable research papers, particularly on bacteriological subjects. The Exhibition was, by common and expert consent, voted magnificent. The microsocope exhibits were excellent. Tropical diseases were quite a little museum for prolonged study. So was the tuberculosis stall of the Imperial Health Office. The syphilis exhibition was a marvel of well-selected illustration specimen and model. The children's section was full of practical detail, and was probably the most popular.

The Congress opened on Sunday 22nd and closed on Sunday 29th. Some 500 went to Hamburg, there to maintain the same unwearied round of talk, entertainment, and inspection of institutions. Altogether, the Congress went with a full swing and momentum gratifying to everybody. The Kaiser was not able to be present in person, but at the opening ceremony the Crown Prince was officially present. The success of the Congress justifies all the congratulations showered on the German Empire and the city of Berlin.

The French Congress of Surgery.

The advantage of having Congresses on subjects which appeal to a limited number is now sufficiently recognised, and no better illustration could be found than in the recent Congress of the Association Française de Chirurgie, which held its Twentieth Congress from the 7th to the 12th October in Paris.

Professor Paul Berger made an ideal President; he is tall, spare, with white hair and moustache, and, as expressed by the *Figaro,* "he was elegant even in the method in which he dragged his leg, which was the subject of an unfortunate sciatica." By birth a Protestant and an Alsatian, he is said to have the most aristocratic practice in the Faubourg Saint Germain. He presided at all the meetings of the Congress, and in the Palais d'Orsai gave a sumptuous dinner to the members.

The banquet of the Congress took place in the Galerie des Champs Elysées, and here for the first time there was speaking after dinner; the toast of the Congress and of the guests was given by the President, and replied to by Ceccherelli of Parma, Monprofit of Angers, Hoffa of Berlin, and Forgue of Montpelier. After-dinner speaking, however, is fortunately not such a prominent feature in France as it is in other countries, and more time and opportunity are afforded for conversation.

There was a sufficient number of operations provided at the different hospitals to allow of the members distributing themselves without overcrowding, which is the more important in Paris, as no sitting accommodation is provided; all must stand round the operating table.

Tuffier at the Beaujon used spinal anæsthesia in a number of cases with complete success. In performing suprapubic prostatectomy it was curious to observe that he made a very large incision into the bladder, through which it was possible for the spectators to see the prostate; having divided the mucous membrane with scissors and seized each half of the enlarged organ with forceps, he shelled it out partly with the fingers and partly with the scissors, without inserting the fingers in the rectum and without having recourse to irrigation with hot water.

At the Necker Hospital, Albarran did two suprapubic prostatectomies; the patient was placed in the exaggerated Trendelenberg position, and a speculum was inserted in the bladder so as to render the prostate readily visible to the operator and assistants; the mucous membrane was divided with the knife. There were hysterectomies, both abdominal and vaginal, at most of the hospitals by Bozzi, Faure, Thiéry, Walther, etc.

We saw Doyen doing an extensive craniectomy on a paralytic idiot; he used his electric saw and perforator with the fearlessness which is characteristic of him; a running commentory upon his own performances and those of other surgeons proved highly entertaining to the spectators.

Calot of Berck-sur-Mer gave an interesting demonstration on the reduction of congenital dislocation of the hip. He reduced nine out of twelve cases successfully; one of the unsuccessful ones he handed over to Hoffa of Berlin, who also failed; and, on the offer being made to Jones of Liverpool, to make a third attempt, he wisely refrained.

Walther, in addition to a number of operations at the Pitié Hospital, demonstrated Lannelongue's method of treating synovial tuberculosis by means of the injection of a solution of chloride of zinc, and he showed a number of cases in which a pronounced synovial tuberculosis of the knee had been completely cured by this method.

The most novel of all the operations observed during the Congress was that by Tuffier, who performed Roux' operation for malignant stricture of the gullet; a segment of jejunum was isolated and connected at its distal end with the stomach; the proximal end was pushed up between the integuments and the sternum until it emerged at the root of the neck. A week or ten days later it was proposed to effect a junction between the gullet in the neck and the proximal end of the intestine, which was now to serve as an œsophagus.

The technique was very much the same in all the hospitals visited. Gloves were only worn in septic cases, and head-gear and mouth-guards were practically never seen; the use of operating tables which permitted of the position of the patient being rapidly changed was universal, and greatly helped the work of the surgeon. In all the Government hospitals what is known as "Tetra" gauze has entirely replaced the varieties formerly in use, and it is estimated that thereby an economy has been effected amounting to several hundreds of thousands of francs per annum. This gauze is prepared in squares of various sizes either in two or in four layers, and the free margins of the four layers are so united in the process of manufacture that there is no fraying of the edges. After use the gauze is washed and boiled in a solution of carbonate of soda, then rinsed, dried, and sterilised *de nouveau* in the usual way.

Where a general anæsthetic was employed, chloroform seemed to be that universally selected. The catgut was sterilised by "tyndallisation" in alcohol at 90° C. In closing the abdominal wall after laparotomies, the peritoneum, aponeuroses, and muscles were united with catgut, and the edges of the skin were brought together with Michel's clips or horsehair.

The sittings of the Congress were held in the large amphitheatre of the Faculty of Medicine. There was a large attendance on each of the days devoted to the reading of papers and the discussions on the special subjects selected.

ORIGINAL COMMUNICATIONS.

GLAUCOMA IRIDECTOMIES.

By G. A. Berry, M.B., F.R.C.S.Ed., *Consulting Ophthalmic Surgeon, Royal Infirmary, Edinburgh.*

It is now fifty years since v. Graefe published the first of his classical papers on the treatment of glaucoma by iridectomy. At that time, although he had only begun this treatment the year before, *i.e.* in 1856, he had already, with a clientèle which was even then truly enormous, acquired a not inconsiderable experience of its more immediate effects.

Much that is now known as regards glaucoma was unknown to v. Graefe. He believed the iris to be a secreting membrane, and the rise in the tension within the eye, which characterises the glaucomatous condition, to be due to increased secretion from its surface. The iris, it is now known, is not a secreting membrane —at least not in the ordinary sense. When inflamed, its vessels exude, no doubt, as do blood vessels elsewhere under similar conditions. To some extent, on the contrary, the iris is an absorbing surface. But the extent to which, under normal, and still more under abnormal conditions, its vessels and tissues absorb is as yet not clearly established.

v. Graefe was ignorant of the effect of miotics in glaucoma. Although he recognised, and was the first to recognise or to prove conclusively, that increased intra-ocular tension was the essential characteristic of glaucoma, he was not aware that the rise in tension was due to a disturbed balance between the transudation into, and the elimination from, the eye of the bulk of its nutrient liquid. Still less did he know that what upsets the balance is generally, if not always, defective elimination, not increased transudation.

Physiological experiment and pathological examination have demonstrated more and more clearly the preponderating rôle played by the tissues at the angle of the anterior chamber in providing for excretion. Indeed, as will be referred to later on, this knowledge has had important bearings—not always, I believe, altogether happy bearings—on the treatment of many cases of glaucoma.

v. Graefe began his operation on what must be looked upon as a purely empirical basis. He had observed that iridectomy, performed in cases of partial corneal staphyloma, tended to prevent further ectasy of the imperfect cicatrix, and thus admit of its more complete consolidation and consequent greater power of withstanding the pressure of the liquid contents of the anterior chamber. He argued that the effect of the operation done for this purpose was to reduce tension—as no doubt it does temporarily to much below the normal amount, owing to the escape of aqueous —and inferred that the tension in glaucoma might be reduced in the same way.

The cases are, however, by no means parallel. In point of fact, they are barely, if at all, related. Yet the effect of iridectomy at once proved in his hands to not only temporarily but permanently reduce the abnormal tension, and thus arrest the process of destruction caused by the disease.

No more beneficent operative procedure than iridectomy for glaucoma exists probably in the whole range of surgical operations. Yet the operation is still an empirical one. It remains to be shown why iridectomy should be capable of permanently reducing increased tension within the eye. The most curious point, however, in connection with this treatment—the brilliant results of which its author lived long enough to prove to be lasting and to see generally recognised—is that its value is even to-day very differently appreciated by different operators. In other branches of surgery an operation which has been introduced and adopted for any definite condition is either abandoned altogether for some better treatment, or modified in different ways at the hands of different surgeons. It is either superseded altogether or perfected.

It would not appear at first sight, however, that so simple a proceeding as cutting into the eye and removing a piece of the iris would admit of much variation. Yet although every writer who gives his experience of iridectomy for glaucoma simply discusses the question of how far his statistics show this to be the best treatment or not, as compared with other methods of treatment which have since been recommended, every one does not by any means operate in exactly the same manner.

Of the literature which has appeared on the subject of glaucoma since v. Graefe's time—which in bulk would no doubt fill a small library—there continue to be published every year not a few papers, more or less exhaustive, dealing with the practical question of the results of operation. In almost all the large foreign clinics at least, statistics are from time to time given. These vary so much that they are often more bewildering than useful. Some surgeons actually discard iridectomy altogether, others only iridectomise in cases of more or less acute congestive glaucoma, whilst some continue to regard v. Graefe's operation as indispensable in all cases. Provided the statistics are carefully and conscientiously drawn up —which many at least bear evidence of being—and provided that the technical skill of the operators does not vary so widely as to make any material difference,—which I think must be admitted in the case of surgeons of experience,—it follows that there must either be some confusion in the classification adopted by the various writers, or some difference in the method of operation, or both. I believe there is both.

I propose here to discuss the matter as it presents itself to me from a large operative experience. Hackneyed as it no doubt is, the question of the treatment of glaucoma is far from being sufficiently settled. It is one, therefore, on which any one who is entitled to hold definite views, arrived at by long clinical experience and not only by theory as to pathology, is also justified in setting them forth. I have done so before, shortly, in a paper read before the Ophthalmic Section of the British Medical Association and also in my "Manual of Practical Ophthalmology." What may be looked upon as the jubilee of iridectomy for glaucoma seems, however, a fitting occasion to do so again.

As regards statistics in the first place. They are based upon classifications which of necessity are not always easy to follow. The same group for one classifier may not contain exactly the same class of cases for another. The reason for this is that *glaucoma*, although the name attached to a class of disease which is always essentially the same, no doubt, so far as etiology goes, not only embraces the most varied types of cases, but no type can be said to be even approximately distinct. There is, in fact, a gradual transition in character in this disease from the most violently acute, fulminating, congestive glaucoma, which may irremediably abolish the sight in a few hours—or even, as I have seen in one case, in a few minutes—and the slow, non-congestive process known as glaucoma simplex, in which the destruction of vision may take twenty years or more in being accomplished.

Where, then, are the lines to be drawn? Obviously they are not likely to be drawn similarly by every statistician. Even the same observer must have a difficulty in classifying every case exactly in accordance with the groups he has imagined. With the best of intentions he might allocate very similar cases to different groups, so as to fit in with his preconceived notions as to how they are likely to be affected by the treatment which he either believes or disbelieves in. For instance, it is customary to distinguish between congestive and non-congestive glaucoma, or rather it is this distinction which is meant when the respective cases, as they still often, though wrongly, are referred to as "inflammatory" and "non-inflammatory" glaucoma. But as many cases are at one time congestive and at another not, and of these, some more often of the one type than of the other, it is practically a "toss up" in which connection they will be placed in a statistical statement. If one could even be sure that cases which are mainly congestive though occasionally non-congestive were always given a place in the congestive column, and those mainly non-congestive but occasionally congestive, in the non-congestive column, some guide would be afforded to recognise what was referred to.

Then there is the still more difficult distinction attempted often between a chronic non-congestive glaucoma and what

Donders and v. Graefe called glaucoma simplex. Indeed, it is far from certain that there are not included in many glaucoma statistics cases which are essentially not cases of pure idiopathic glaucoma at all. v. Graefe first classified the type which now goes by the name of glaucoma simplex as amaurosis with excavation of the optic nerve. In this group he recognised a similarity to glaucoma, but only after some time accepted the name proposed for the type by Donders. The original "glaucoma simplex" is, however, certainly not the invariable type to which different writers give that name.

Then there can be no doubt that surgeons in different parts of the world, and in different parts of the same country, see the cases which they are called upon to treat at different stages of the disease. This is particularly the case where only one eye is affected, and there is a difference in this respect too between private and hospital cases. The general practitioner is often blamed for overlooking a glaucoma, and thus losing valuable time, to the injury of the patient, who in consequence may lose his sight altogether, and certainly always necessarily loses more than might have been the case had he been properly treated at an earlier stage. All oculists have had many experiences of this. But the great variation in the degree and even in the character of the symptoms of glaucoma cases makes it almost inevitable. I have rather been struck by the frequency with which the general practitioner, in Scotland at any rate, who must keep abreast of so many other matters, recognises, or at least suspects, glaucoma,—all the more, too, when one considers that the diagnosis is by no means always as easy a matter as might be supposed, even for the expert. Cases of the more or less non-congestive type do not so altogether infrequently escape the notice of the ophthalmic surgeon.

As to diagnosis, it is only such cases and cases of real glaucoma simplex that should present any difficulty. In an exhaustive treatise, published some years ago by one of the most experienced oculists of Paris, v. Wecker, a great deal of space was devoted to the subject of the diagnosis of glaucoma simplex. In that treatise many cases are recorded in illustration of the author's remarks on diagnosis. Yet these cases are certainly not all recognisable as glaucoma simplex. Not a few of them are not recognisable as glaucoma at all. The upshot of v. Wecker's remarks, so far as a very confused treatment of the subject admits of their being understood, appears to be that it is not always possible for any one else but v. Wecker to diagnose glaucoma simplex! Where, then, is the general practitioner as regards glaucoma simplex, if only one man exists who can invariably diagnose it?

Fortunately things are hardly as bad as v. Wecker would have one suppose. He had, too, arrived at this enviable proficiency in diagnosis without having learnt the value of a symptom which was nevertheless known to many at the time he wrote. That symptom is probably, if not certainly, absolutely characteristic of glaucoma, and is invariably found in glaucoma simplex even before the disease has advanced sufficiently to make any otherwise appreciable diminution in the functional activity of the affected eye. It is what is known as Bjerrum's symptom, and consists of a characteristically shaped relative scotomatous area which can readily be detected by a suitable method of subjective examination. Thus, if the field of vision be explored with a white object against a very black background, an object so small that it subtends an angle to the eye of about 5′—which in practice is got with a small disc 3 mm. in diameter, held against a black velvet screen at 2 metres distance—then an extremely small amount of pressure paresis of the optic nerve is revealed. There is by this means demonstrated, without difficulty, a defective area, extending always from the blind spot in some direction. Though distinctly visible in other parts of the field up to its limits—which are greatly restricted in all directions for such a small object as compared with the area over which some visual power exists—this object is lost to view not only at the blind spot, but over a very much larger area, which is, however, always in direct continuity with the blind spot. The value of Bjerrum's symptom is of course, from a diagnostic point of view, most evident in cases in which good central vision still exists; as that is the kind of case in which a doubt as to the presence of glaucoma may be entertained. From the point of view of pathology, it is of course also suggestive of the blindness caused by glaucoma being due to the effect of pressure on the optic nerve itself. The retinal vessels, it has been supposed, suffered from the pressure, and thus the nutrition of the retina became impaired, and its functional activity lost. Bjerrum's symptom points to the nerve, but in addition to this the intraocular pressure probably never rises as high as the arterial pressure in the retinal vessels, even when the eye is stony hard; and most cases suffer a progressive blindness, with much less—sometimes, indeed, with a hardly demonstrable—increase of tension.

So far as my experience of Bjerrum's test goes, which extends back to the time 1889, when it was first introduced, the peculiarly situated relative scotoma thus shown is quite characteristic of glaucoma, and does not occur in optic atrophy. This has been very fully confirmed recently by Dr. Arthur Sinclair, who carefully examined a number of cases of glaucoma, and compared them as regards this symptom with other affections in which the optic nerve is involved. So delicate is this test, that in not a few cases in which there has been no other indication which would have led one to suspect glaucoma at all, except the existence of a more or less marked glaucoma in the other eye, where in fact there has been full vision as tested with the ordinary test types, the characteristic relative scotoma has been detected. This was first done in cases of my own by Dr. Ramage, my house-surgeon, at the time in 1890, and recorded by him in his thesis for M.D. Practically, then, it may be said that the diagnosis of any case of glaucoma is always possible.

One is accustomed to recognise in many cases of glaucoma what is called the premonitory or prodromatous stage, *i.e.* the stage in which such indications as corneal haze with its attendant cloudy and rainbow vision, more or less pain, etc., occur occasionally, but disappear without leaving any trace so far as an ordinary subjective examination suffices to detect. Whereas so soon as demonstrable defects remain permanently after the tension has subsided, the disease is looked upon as being "confirmed." With the screen test, however, pressure symptoms are found indicating that a glaucoma is really confirmed before it would otherwise be looked upon as having passed the prodromatous stage. This is important as regards treatment, as will be seen later on.

From the point of view of statistics, there is, then, both the question of discriminating with certainty between glaucoma simplex and optic atrophy—which is not always done—and the question of drawing a hard-and-fast line between such cases and the only slightly congestive type into which they insensibly merge—which is impossible.

A fairly useful classification for statistical purposes, though still not free from the sources of confusion to which I have referred, would be into (α) acute congestive glaucoma, (β) chronic markedly congestive glaucoma, and (γ) chronic non-congestive glaucoma, including in the last category cases which only occasionally exhibit slight signs of congestion, but which are mainly characterised by more or less increased intra-ocular tension at times, excavation of the disc of a glaucomatous type, spontaneous or readily elicited arterial pulsation, failure of central and peripheral vision however slight, without at any time, or only very rarely, presenting any congestion, corneal haze, corneal anæsthesia, or spontaneous pain.

As has been said, v. Graefe was not aware of the importance of inducing miosis in glaucoma. This was subsequently discovered by Laqueur. Pilocarpine and eserine, on account of their miotic action, now form an indispensable part of one's treatment of glaucoma, and that whether operative treatment has been resorted to or not. The rôle played by the tissues at the angle of the anterior chamber has also been referred to as having had an influence on the question of treatment. The filtration channels in this situation may become temporarily or permanently blocked, and as they undoubtedly are the main excretory channels, this blocking, by causing excretion to fall behind transudation from the ciliary processes, leads to a disturbance of balance and consequent rise of intra-ocular pressure. Theoretically, the pressure within the eye might rise to equal the blood pressure in the arteries of the ciliary processes, which is, roughly speaking, twice as great as that distending the eye. This, however, never appears to happen, unless perhaps in fulminating glaucoma. The increased tension usually falls far short of the blood pressure. Even a slight pressure within the eye will cause damage which, if continued for any time, is permanent. In this respect it is probable that individual differences exist. At all events it is astonishing to find in some cases of simple glaucoma how little evidence of tension may exist along with sufficiently well-marked pressure symptoms.

Taking the two points together, the effect of a miotic in reducing abnormal tension and the effect of blocking of the angle of the anterior chamber in causing the tension to rise, it was natural enough to conclude that the effect of a miotic was due to the iris periphery being thereby dragged upon so as to free the angle. A similar effect of iridectomy was also inferred. This led many to believe that the section into the eye, and not the removal of a piece of iris, was what gave the desired result. This diverted attention from the iris to the incision, and caused speculation and experiment as to the exact position which should be given to it, with the result that there originated a rival operation to iridectomy for the cure of glaucoma. Many gave up the excision of a piece of iris, and confined themselves to making a large and very peripheral section into the eye. This operation, however differently it may be done, is what goes by the name of sclerotomy.

This proceeding, adopted then in the first place in the light of a clearer conception of the physiology of excretion from the eye, seemed also to be indicated by the rules which v. Graefe had laid down, as the result of his large experience and keen insight, for the successful performance of iridectomy in glaucoma, particularly by the point on which he laid stress, namely, the importance of making the incision at the corneo-scleral margin as peripheral as possible. Some have apparently been content to adhere to sclerotomy and to substitute it for iridectomy in all cases of glaucoma. The majority of operators have found, however, that not only can iridectomy not be altogether discarded, but that, in the congestive type of glaucoma at least, it is more effectual than sclerotomy.

In my opinion, those who have been greatly influenced by the current theories as to the pathology of glaucoma, and have in consequence attached primary importance to the incision, even when they have not given up the excision of a piece of iris, have come to perform the operation of iridectomy in glaucoma in a way which not only does not give the best results, but sometimes even defeats its own object. To understand this fully, however, it will be well to consider what were the rules which v. Graefe instituted, and how they were arrived at—rules which in the majority of instances are still adhered to or are at least believed to be followed.

v. Graefe from the first recognised that the object of an operation for glaucoma must be to provide for the reduction of tension, and he kept this aim consistently in view. Shortly, the three classical rules are—(1) The incision must be made as peripheral as possible; (2) the portion of iris removed must be as large as possible; (3) the aqueous humour must be allowed to escape slowly.

His exact words with regard to the first rule are—"The wounds must be placed as excentrically as possible, so that the outer wound comes to lie ½''' into the sclera, while the inner wound falls exactly in the boundary between cornea and sclera. In this way it is possible to remove the iris right up to its ciliary insertion, and it appears that this is necessary to get the result, or at all events insures its being got."

Two remarks on these sentences suggest themselves—(1) Although v. Graefe recommends that the incision be made as peripherally as possible, the further description of its site does not altogether bear this out; as described, it is *not* what one would call an excessively peripheral incision; and (2) evidently he attached importance to the removal of the periphery of the iris. To these points I shall, however, return later on.

With regard to the second rule, v. Graefe says: "The excised piece (*of iris*) must be as large as possible"; and further on, "The more intense the process, the more pronounced the increased tension, the more extensive do I advise the excision to be made."

On this, too, the following remarks are suggested: (1) We now know that it is impossible, short of actually tearing it away, to remove the iris right up to its peripheral attachment; and (2) v. Graefe was influenced as regards the amount of iris which he thought right to remove by his idea already referred to, that it was a secreting surface, and that increased secreting from it constituted an element in the disease. Moreover, finding this treatment successful, there would be no motive to change it. I can at least find no evidence that he ever tried smaller excisions.

The third rule calls for little comment. Every operator knows from his own experience that the aqueous humour must be allowed to escape slowly. Serious consequences may result from inattention to this point in cases where the tension is very high at the time of operation. Accustomed as one is to the importance of this rule, nothing looks more rash and inexperienced than to see an operator quickly withdraw his knife in operating for glaucoma, as if he were afraid of it!

v. Graefe made his incision with the lance-shaped bent keratome. He regarded the use of the narrow cataract knife for this purpose as an unimportant modification, but did not altogether condemn it. Although from his own description his incision would not appear to have been extremely peripheral, I have heard from those who saw many of both his earlier and later operations, that he regularly did make it, or aimed at making it, as peripheral as was possible with any safety. This practice often caused very disturbing hæmorrhage and other difficulties, so that a good many of his pupils were led to make the opening into the anterior chamber less peripheral than he did himself.

I have no doubt, from an experience with both instruments, that it is safer and easier to make a really clean peripheral wound with the lance-shaped keratome than with the Graefe knife. For many years I have invariably used the former, and only resorted to the narrow knife in exceptional cases, where the eye has been deeply sunk in the orbit and the palpebral opening small. The lance-shaped knife undoubtedly causes less disturbance of the parts, and enables one to make a section into a shallow chamber much more satisfactorily. The attempt with the Graefe knife to make a good peripheral incision often leads to dragging of the iris periphery in front of it, and other difficulties which ought to be avoided. Indeed, when compelled to use the narrow knife, I do not attempt as peripheral a section as if I were making use of the lance. The fear that with it the lens may be wounded I have not found justified. After a long experience of it, I do not remember of this accident occurring except on one occasion, which happened also to be one of the very first cases I operated on, where the accident was entirely my own fault. The knife has to be pushed rapidly into the chamber, and its point directed forwards the moment the resistance of the coat of the eye is felt to cease. Sometimes in particularly difficult cases the iris may be punctured towards its periphery by the point of the knife, but this need not deter one from finishing the section.

In v. Graefe's later papers, allusion is made several times to the question as to how far operation, in strict accordance with the rules he laid down, was necessary in order to secure the maximum of success. One passage bearing on this point may be quoted; he says of the effect of iridectomy in congestive glaucoma: "Although it is certainly advisible in this case also to make the excision of the iris large and as peripheral as possible, yet the non-fulfilment of this condition does not always or even generally lead to failure in the result of an iridectomy. I have seen a very large number of eyes affected by marked inflammatory glaucoma in which the iridectomy done has badly complied with the prescribed conditions, but in which nevertheless a permanent cure has been attained. The more the disease comes on with a sudden turbidity of the media, the more does the real crux of the operation appear to lie in the excision of the sphincter pupillæ, whilst the really strict glaucoma operation becomes the more indispensable the freer the particular type is from turbidity of the media, and is characterised only by increased tension. I do not wish by these remarks to encourage the mistake of making a careless excision of the iris in primary inflammatory glaucoma. On the contrary, I consider that even in such cases the eyes are more fully secured by operation done according to the recognised rules."

Another fact which seems to have weighed with v. Graefe in recommending a very large iridectomy, was that in cases in which a first iridectomy had failed to give a permanent result a cure was sometimes effected by doing a second iridectomy.

I have not been able to find whether v. Graefe ever experimented in the way of making any modification in his method of operating in the case of non-congestive glaucoma. Evidently, however, he or his pupils must occasionally, and no doubt unintentionally, have failed to adhere to the rules which he had formulated. In his paper of 1862 there is a passage which shows this. After referring to cases of acute glaucoma operated in the early stage in a way which fell short of that prescribed, he adds: "As, however, in other cases, particularly cases of chronic glaucoma, the effect under such conditions turned out to be insufficient, and a second iridectomy was required, the rules as they stand are thereby confirmed, and great weight has to be attached to them in chronic glaucoma and the later stages of acute glaucoma."

It may be remarked that in non-congestive glaucoma it is almost always a comparatively easy matter to operate with precision. The effect of operation is, however, in many of these cases less certain. Consequently it is not unreasonable to suppose that v. Graefe's main reason for continuing to advocate a close adherence to the rules which he had established, was that being satisfied with them he saw no object in modifying them.

The point referred to in the quotation at p. 387, in which there is attached a primary importance to the excision of the sphincter pupillæ, is interesting, as some subsequent operators have held quite an opposite view, and have recommended and practised the retention of the sphincter. Snellen, for instance, whose practical experience was great, and whose judgment was of the highest order, believed in leaving the sphincter, while making a free excision of the more peripheral portion of the iris. Here, however, the effect of a miotic influenced the new view as to the most suitable way of operating. By the retention of the sphincter it was thought, and perhaps rightly, that the subsequent effect of treatment with a miotic must be more effectual. Still, it is open to doubt whether as an operation this way of performing iridectomy is really as effectual as that more generally in use, in which the sphincter is included in the portion of the iris excised.

With regard to miotics, their constant use in practice in the present day has introduced a question of importance which necessarily presented itself differently to v. Graefe as well as to his contemporaries and immediate successors, many of whom were also his pupils and greatly influenced by his teaching. That question is: What is the course of a glaucoma according as iridectomy is done for it or not? The previously known medical treatment—and many things had been tried—had certainly very little influence on the course of glaucoma. By the use of miotics, however, it is by no means easy to assert positively whether certain cases would do, or actually do, as well or better than when subjected to iridectomy.

Comparatively little is known as to the average course of a non-congestive glaucoma which is left to itself or treated with miotics alone. Statistics on this point are not, so far as I know, available. They would probably be of little use unless, perhaps, they were drawn up by a single observer of judgment and large experience—which would at all events ensure that the cases compared were fairly similar. It is evident that this even would not remove difficulties which would detract from their value.

My own experience, without attempting anything of the nature of statistics, would lead me to favour iridectomy in all cases. I can at least recall a good many cases in which a patient has refused, or has not returned for, operation in the second eye, and in which the disease in the iridectomised one has either been permanently checked or has progressed less rapidly than in the other. In some of these cases the second eye had been treated continuously with miotics, and yet had failed more rapidly than the one which had been iridectomised. Having always made it a rule to operate on the worse eye first, except where it had lost all useful sight, there could be no doubt of this, even in cases where it was difficult, as sometimes happens in hospital practice, to consult the records after a long interval of time.

Another point that appears to me to be more than suggestive in support of the superiority of iridectomy over treatment with miotics is, that I could point to not a few cases which I have had under observation from time to time for twenty years and more, in which after an iridectomy done at so late a stage of a chronic glaucoma that only a portion of the outer field remained, no appreciable change has afterwards taken place. The small amount of sight existing at the time of, or immediately after, the iridectomy has stood for all these years. A similar result has never once come under my notice in cases under miotic treatment alone. I have seen many remnants of vision go entirely. I have never seen any retained for many years. The fact that I have made a habit of continuing miotic treatment even after iridectomy, does not alter the conclusions which one must naturally draw from such an experience. It is, of course, possible that iridectomy plus the continued use of miotics may be better than iridectomy alone. Indeed, it is the extra chance that miotic treatment seems to offer in consolidating the effect of iridectomy that leads one to adopt it. It may do no good. It is pretty certain, on the other hand, that it does no harm.

My experience of glaucoma iridectomies is that when the operation succeeds in causing a permanent reduction of tension, the disease is stopped and no further destruction takes place, whatever may have been the stage arrived at or the type of the disease for which iridectomy has been done. v. Graefe believed that a stage might be reached at which degeneration would proceed independent of any return of glaucomatous symptoms. This is certainly not the case, nor do I suppose there are many at the present day who believe it to be so. On the other hand, the stage as well as the type of the disease has an undoubted bearing on the efficacy of the operation to permanently reduce the tension.

It may be taken as a quite general experience, that the more chronic, less congestive and older standing, is the condition of glaucoma for which an iridectomy is done, the more doubtful will be its effect. All things considered, it is natural enough that the matter of the line of incision should have so long engaged the attention of operators. In my opinion, however, too little importance has been attached to the possible disadvantages entailed by what may be looked upon as an excessively peripheral section.

Many have been led, by consideration of the points to which I have referred, to conclude that the incision should, as far as possible, actually lie in, or aim at opening out, the space of Fontana at the angle of the anterior chamber. Everyone who has been tempted to try to get an incision so far back as this has experienced an increased difficulty in operating owing to the hæmorrhage caused by the general hacking up of the tissues, the subsequent encleisis and irregular healing which is caused more particularly when the narrow Graefe knife is used. Nor is there, so far as I can judge, any sufficient evidence to show that such very peripheral incisions are better than less, though still excentric incisions, which suffice for the removal of iris quite as near to its root. I cannot see how a wound made in the tissues which normally provide for filtration, but have become more or less blocked, can be calculated to permanently improve the patency of the filtration channels. Cicatrisation in such a wound, particularly if, as so often happens, it is not a clean cut into the coats of the eye alone, is surely more likely to seal up the existing channels more effectually than ever.

That this is not so often the case, or that the effect of doing so should not be so apparent, as might be expected, is, I believe, due to two circumstances. In the first place, the attempt to make a section actually lie in the space intended may not be successful, and cicatrisation near to but not in the filtration angle may conceivably have the effect of freeing it to some extent. In the second place, such very peripheral sections are often followed by an imperfect scar, a cystoid scar, one which therefore admits of more or less filtration, and in fact comes to act as a kind of safety valve.

There is no doubt that a filtration scar of this kind may be of use as a means of arresting glaucoma in some cases. Everyone who has had much experience of glaucoma operations will know of cases where the cystoid cicatrix is more or less evidently what stands between the eye and its complete, or at least its more rapid, destruction. Of not a few cases of this kind which I have seen, I may mention one which I have had under observation for eighteen years now, in which the scar has remained cystoid, and has its efficiency as a filter increased from time to time by the habit which the patient has acquired, of forcibly rubbing his eye when he notices it become obscured. This causes a trickle of aqueous humour to escape, of which the patient is conscious, and which is immediately followed by the disappearance of haze.

But though ready to admit the value, under certain conditions, of a cystoid cicatrix, I am far from believing that it should be courted as it were, as some think, and that the incision should be purposely always made so as to lead to a filtration scar. Apart from the danger that there is of such a scar becoming infected, and thus lead to serious inflammation or even purulent destruction of the eye, the condition is one by no means ideal as a cure for glaucoma. In some desperate cases, and particularly in advanced buphthalmos—the form which glaucoma assumes in children—I do aim at getting something of the kind, that is, I make a double puncture (puncture and counter-puncture with a narrow knife) of the eye, so far back as to pass through the iris to considerably behind its root. In buphthalmos, however, except at an early stage, it is not safe either to make a large incision or to remove a piece of iris.

As regards sclerotomy in glaucoma, I have not found it superior to iridectomy as a primary measure in any class of case. No doubt as a second operation when iridectomy has failed, it may be, in fact it ought to be, tried. But to this I shall return. My experience leads me to think that the only chance of success when sclerotomy is done as a subsequent measure, is in the production of a filtration scar. My own practice is to recommend *iridectomy in all cases, whatever the stage or type of the disease, so soon as there is any demonstrable evidence of its being confirmed.* This includes, as already explained in referring to Bjerrum's symptom, many cases which are still apparently only in the prodromatous stage.

I do not go so far as to propose operation whenever there have been prodromata, but only do so if some real and permanent loss of functional activity of the eye has been sustained. There are cases in which prodromata occur at very rare intervals, and can be quickly checked when they do occur by the use of miotics. There are other much rarer cases, in which, notwithstanding repeated prodromata the vision remains unimpaired for years. The most striking instance of this kind that has come under my notice was that of a lady whose attacks of obscuration and rainbow vision came on for years practically almost daily, and passed off at once under pilocarpine without leaving any trace. Such cases one would naturally not operate upon.

Unfortunately the rule to iridectomise at the earliest possible moment in a confirmed case cannot always, or even generally, be put in practice. A large proportion of cases are first recognised relatively late in the progress of the disease, while in other cases it is not possible to obtain the sanction of the patient, who is unable to understand or realise the danger of delay. In these respects the surgeon is more favourably situated when the second eye is attacked. It therefore often happens that the treatment of the second eye, having been undertaken at an earlier stage, meets with more success than that of the first eye.

Early operation, then, is the first practical rule which I would emphasise. I do not believe in putting off time with miotics when the disease has really been confirmed. Miotics may, on the other hand, be used with advantage more or less continuously after operation. For this purpose, too, I prefer pilocarpine to eserine. My second rule is: *begin with iridectomy in all cases.* It is not only the most likely to prove effectual; it is also, with rare exceptions, the treatment which is least likely to do harm. Indeed, iridectomy when properly done is so safe, that it should never be put off on the plea that the patient still has very good sight in the affected eye. No doubt there may often be a slight deterioration following iridectomy, but this should be faced in view of the great chance which it affords of arresting the progress of the disease. The most serious cases to deal with in this respect are those in which very fair central vision coexists with a loss of the field close up to the point of fixation. Here an iridectomy may be followed at once by great deterioration of sight owing to the point of fixation being invaded. This risk is not so great in my experience as some seem to believe. It should not, I think, influence one in recommending iridectomy, though it is only right that the patient should be made fully aware of the existence of such a risk in his case before he consents to operation.

One of the rare exceptions to the rules to operate early and to begin with iridectomy is the case of true hæmorrhagic glaucoma —really I think a secondary rather than a primary glaucoma. My practice in such cases is to refrain from operating altogether.

Some remarks on the method of performing iridectomy must qualify the advice I have ventured to give above. In the first place, as already said, the instrument best suited for the purpose is the bent lance-shaped keratome, usually in this country referred to simply as the keratome. The degree of excentricity or periphericity of the section made with this instrument should, I think, vary according to the case for which the iridectomy is done. The guide should be the degree of difficulty which making a peripheral section presents. It is a mistake to attempt what is practically impossible, and important to remember that the section should not be made so very peripheral as to involve one in the difficulties which have already been alluded to. Fortunately, the cases in which it is very generally most difficult to get a very peripheral section, cases of acute congestive glaucoma, are also those in which it is least indispensable. In most cases of chronic only occasionally congestive, or of simple, glaucoma, there is no difficulty with the keratome in getting a section quite as peripheral as v. Graefe recommended.

A peripheral section has been sufficiently proved by general experience to be desirable. This being the case, it is perhaps of little consequence to consider why it should be so. Certainly the belief that it opens out the filtration angle is open to doubt, and has, I believe, led to much of the non-success which has occurred at the hands of those operators whose glaucoma iridectomies have proved unsatisfactory. A more probable explanation of why a reasonably though not excessively peripheral section should be useful is that it admits, while not interfering with the tissues too near the angle of the anterior chamber, of removing a sufficiently peripheral portion of iris.

Another point in the operation to which I would refer is the amount of iris which should be removed. Provided one gets a good depth of iris, I believe it is of little consequence how much is removed in breadth, or, in other words, what the size of the sector removed is. It must, however, be of some size not merely such as might be got by slitting it down radially. There must be a coloboma formed to prevent the possibility of union of the cut edges. But the width of the coloboma is in my experience apparently immaterial. At all events I have got as good results by making a coloboma of not more than 4 to 5 mm. in breadth, but carried well up to the iris root, as with the very large ones which used to be practised.

An important indication may be got very soon after operation as to whether the iridectomy is likely to prove permanently useful or not. The smoother and more natural the healing, and the flatter and more consolidated the scar, in the coats of the eye, the more likely is the operation to eventually prove successful. An ectatic, weak scar or a cystoid scar only comes, provided the operation has been done on the lines sketched above, when the iridectomy has failed to re-establish a proper balance between transudation and excretion. Their appearance does not, however, necessarily mean failure. Two things may happen. The scar, which to begin with is weak and pouting, may, as more favourable conditions become slowly established, consolidate and flatten. Or, again, the scar may become a safety valve and filter some or all of the liquid out of the eye which should escape by the normal channels.

The object of this paper has been mainly to give my own views on the practical points connected with iridectomy for glaucoma, and this with reference to the cases and stage of the disease for which that operation is specially indicated, as well as to give certain details of the way of operating which are the outcome of what I have practically found to be important in order to secure the maximum of success. If, in conclusion, I venture to offer some suggestions in explanation of the action of iridectomy, I do so with much less confidence. My views on this subject have gradually formed from practical experience, along with a careful study of what is so far known of the pathology of the disease. The effect of the operation depends, I believe, mainly upon three conditions—(1) The state of the iris at the time of the operation; (2) the condition at the same time of the filtration angle; and (3) the manner of operating.

As time goes on in the process of glaucoma, the iris appears to undergo a change in the direction of atrophy. The more atrophic the iris the less is to be expected from the making of a coloboma in it. All parts of the iris do not, however, always seem to be equally degenerated, and hence it may happen that when one iridectomy has failed a second may prove successful. In this connection it is interesting to note, too, that v. Graefe was led by experience to advocate that a second iridectomy should be made opposite to the first. At one time I thought, influenced no doubt mainly by cosmetic considerations, that a second iridectomy might, with equal chances of proving successful, be made close up to the first, the original coloboma being thereby simply enlarged. I no longer hold that view. I believe v. Graefe was right in this, as he has proved to have been in so many other points. It seems indeed not unreasonable to suppose that a coloboma placed diametrically opposite to the first may have often a better chance of falling within an area of iris which is less abnormal, in which the vessels particularly have undergone less degeneration. When the iris has been cut its absorptive power is most likely increased. From being of comparatively little importance in excretion, it comes to take a larger share. This has not, it is true, been demonstrated conclusively, but is indicated by what actually takes place in so many cases. I have previously on several occasions, as, *e.g.*, in a paper in the *British Medical Journal*, referred to this as one probable element of the action of iridectomy. Quite recently it has been shown by Henderson that after iridectomy there is never any cicatrisation of the stump of iris left, so that years afterwards it presents the appearance of having been cut post-mortem. This is important, as indicating that the explanation I have given would suffice to account for not only a temporary but also a permanently increased absorptive action.

Again, the changes which undoubtedly do take place in the meshes of the pectinate ligament at the filtration angle, and which as undoubtedly impair the function of this region as an excretory channel, cannot be removed by operation. On the other hand, I see no reason for supposing that they are progressive apart from the continuance of increased tension on which they seem to depend, as well as which they cause. This I argue from the fact already referred to, that cases operated on at a late stage may remain permanently cured. It is, of course, possible that sclerosis does proceed in that situation, and that the cut iris suffices for absorption. It is perhaps also possible that degenerative changes in the vessels of the ciliary processes which occur as the last stage of an absolute glaucoma may have begun, so that the balance between transudation and elimination may be in part maintained by transudation becoming less. Many reasons, to which I need not here refer, as for instance the behaviour in the case of cystoid cicatrix, make me incline to the belief that after a successful iridectomy the progress of sclerosis at the filtration angle ceases, and that the channels remain sufficiently patent to provide, along with the greater absorption from the mutilated iris, for an efficient balance.

How the manner of operating may act I have already indicated. In the first place, some importance must be attached to the mere respite which the wound opening into the eye gives before it heals firmly. The tension is thereby in almost all cases immediately reduced, and time is given for the eye to accommodate itself to the new conditions. As to the section, while it may, if placed too peripherally, possibly impede instead of improving the filtration, it cannot, I think, have any marked favourable effect of itself. Only when a re-establishment of equilibrium is not got by iridectomy does the question of what may be done by a section alone, come to be considered. An attempt must then be made to get a filtration scar. This I am of opinion is preferably done by means of a double puncture, placed so far back as to button-hole the iris, but only to make a complete severance of the sclera for a distance of 2 to 3 mm. at either end. The knife should be given a sawing motion to cut through the deeper lying tissues of the filtration angle, as far as possible, between the points of puncture and counter-puncture. This is the method of performing sclerotomy which, after trying several others, I have found gives the best results.

To recapitulate shortly:

Statistics of the results of glaucoma operations are apt to be misleading. Even the question as to whether a correct diagnosis between simple glaucoma and optic atrophy has been made in many cases included in such statistics, is open to doubt.

Iridectomy is capable of permanently arresting glaucoma at all stages and in whatever form it makes its appearance.

The longer the disease has lasted, irrespective altogether of the destruction which it has caused, the less likely is iridectomy to succeed.

Iridectomy should in all cases be done so soon as there is evidence of the disease being confirmed.

It should also always be tried as a first measure, however far the disease has advanced.

The operation should be followed up by treatment with miotics, and this treatment should be continued indefinitely.

In operating, the incision should be made with a keratome, and placed as peripherally as possible without leading to difficulties.

The amount of iris removed need not be as great as originally recommended by v. Graefe.

Cases in which iridectomy followed up by miotics fails should be treated by the formation of a cystoid cicatrix, the section into the eye being made so as to include the tissues behind the root of the iris.

MUCOCELE OF THE ACCESSORY NASAL SINUSES.

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(Plate VII.)

In the *Edinburgh Medical Journal* for October, November, December 1903, and January 1904, I contributed an article upon the "Pathology of 'Bone Cysts' in the Accessory Sinuses of the Nose." Since its publication I have had the opportunity of treating several additional cases of a similar nature, and it is my intention, therefore, to record here all the cases of this kind which have come under my care.

By the term "mucocele" of a sinus, we understand a distension of one or more of the walls of the cavity, and an accumulation within it of a mucous secretion resulting from obstruction of its outlet. The accessory sinuses which may be thus affected are the frontal sinuses, the ethmoidal cells (usually the anterior group), including the air space in the inferior ethmo-turbinal or middle turbinated bone, and the maxillary sinus or antrum of Highmore. Mucocele of the sphenoidal sinus does not appear to have been

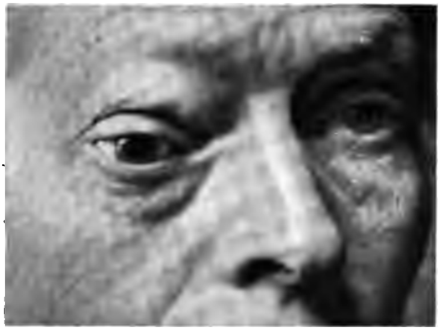


Fig. 1.

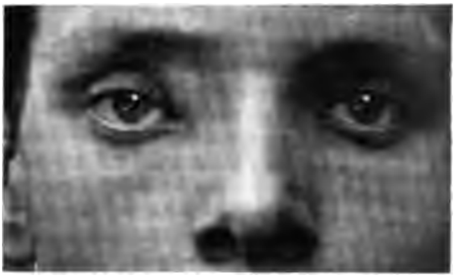


Fig. 4.

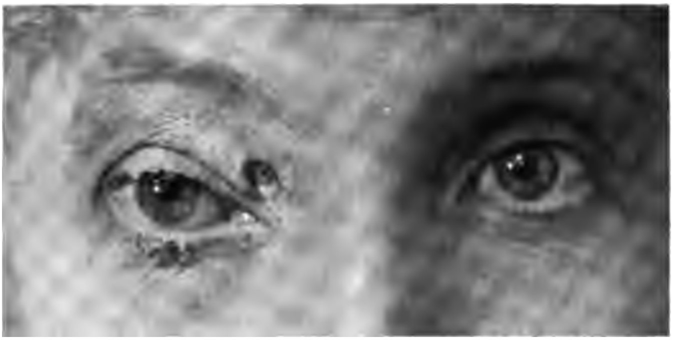


Fig. 2.

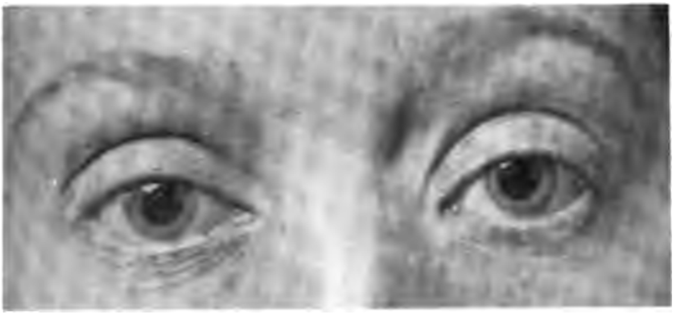
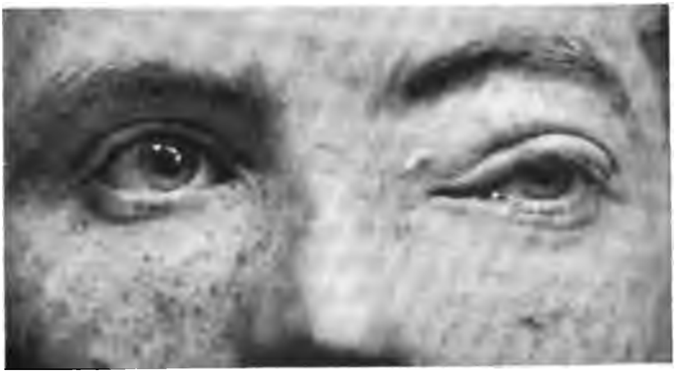


Fig. 3.



described, and no case of the kind has come under the writer's notice. The distension of the antrum with occlusion of the ostium maxillare is a very rare condition, the possibility of its occurrence, indeed, being disputed by some.

Cases of mucocele of the accessory nasal sinuses naturally fall into two groups. First, those in which the chief clinical phenomena are associated with the orbital cavity; and, secondly, those in which the symptoms are mainly referable to the nasal cavity. To the former belong the affections of the frontal sinus and the anterior ethmoidal cell labyrinth situated in the lateral mass of the ethmoid bone. In the latter must be placed mucoceles of the inferior ethmo-turbinated bone and the maxillary sinus. Only the cases contained in the first of these subdivisions will be dealt with in this paper.

They are ten in number. Of these, the frontal sinus was affected in seven, the ethmoidal labyrinth in three; the right frontal sinus was the seat of the affection in six, and the left sinus in one; the right ethmoidal labyrinth in two, and the left in one instance. The preponderance of the frontal sinus affection in this series merits special notice, as a study of the literature of the subject goes to show that mucocele of the ethmoidal air cells forms the larger proportion of recorded cases.

Of the ten patients, seven were females and three males; their ages varied from 18 to 52 years. Five were met with in early adult life, at the ages of 17, 18, 19, 28, and 33 respectively. These figures, however, do not accurately represent the age at which the affection first showed itself, as the three patients aged 17, 18, and 19 respectively, when first examined—each of them with ethmoidal mucocele—had noticed the orbital swelling so characteristic of the condition, five, one and a half, and nine years prior to seeking advice. There was clinical evidence, therefore, of the existence of the affection at 12, 16½, and at 10 years of age. The ages of the remaining five were 37, 43, 44, 51, and 52 respectively. In the first two the orbital swelling was observed two and a half and four years before the patients were examined; hence, in at least seven of the whole series there was actual evidence of the mucocele before the age of 40.

CASE 1.—*Mucocele of right frontal sinus.*[1]—J. K., a married woman, æt. 37, was admitted into the Eye Department, Royal Infirmary, under the care of Dr. George Mackay, in June 1903, complaining of a swelling in the right orbital cavity, and displacement of the eyeball. She had first noticed the swelling two and a half years before admission, and, with the exception of the increasing disfigurement caused thereby, she had had little or nothing to complain of. She had never had any pain or discomfort, nor had she felt any tenderness when touching the swelling. She had occasionally noticed the presence of slight mucous discharge from the right nasal cavity. Two years before her admission,

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[1] Case published *Edin. Med. Journ.*, 1903.

Dr. Mackay of Aberfeldy, under whose care she then was, incised the orbital swelling, evacuated its mucoid contents, and allowed it to drain for a few days before closing the wound. As a result of this, the swelling was considerably reduced in size, but at a later date it again commenced to increase.

Examination, on admission in the month of June, showed that the right upper eyelid was considerably swollen throughout almost its whole length; the two palpebral fissures were no longer on the same plane, that on the right side being at a lower level. The patient could not raise her right eyelid, while the examiner, too, had some difficulty in lifting it from the underlying globe. The more prominent part of the swelling was situated below the middle and inner thirds of the supra-orbital margin, and it was covered by skin of a normal appearance. On palpation, it was found to be soft and fluctuating; there was no parchment-like feeling on palpation, nor could any bone be recognised as forming its wall. When the finger was carried downwards from the supra-orbital margin, it passed at once on to the soft fluctuating swelling in the upper eyelid. Pressure in this situation did not cause any discharge to pass into the nose, nor was any pain associated with digital examination.

The right eyeball was displaced downwards, outwards, and forwards, and the movements of the globe were to some extent restricted. Although light perception was present on the affected side, the patient had practically no vision in the right eye, owing to the presence of a well-marked staphyloma of the cornea.

Examination of the right nasal cavity showed nothing abnormal. There was no trace of pus or other secretion in the middle meatus, or elsewhere in the nose or in the naso-pharynx. A more searching investigation, with the aid of cocaine and adrenalin, revealed nothing further. The right middle turbinated body presented a somewhat large anterior extremity, and was certainly larger than that upon the left side, but the mucous membrane covering it was not hypertrophied. A fine probe could not be passed upwards in the direction of the naso-frontal canal.

The history of the case, in conjunction with the local appearances, led us to believe that the condition in all probability was one of mucocele of the right frontal sinus. Through a skin incision one inch in length, beneath and parallel to the supra-orbital margin, the sinus was explored. After division of the subcutaneous and muscular tissues, a quantity of purulent fluid escaped; no bone was met with in the dissection. The finger introduced through the wound entered a cavity which was evidently the frontal sinus, and it was found that the floor of the sinus had entirely disappeared. The supra-orbital margin formed a free bony edge above, and in a similar way the frontal process of the superior maxilla was unattached along its posterior margin, the lachrymal bone having evidently also been absorbed. The orbital tissues, therefore, constituted, so to speak, the floor of the sinus. On the posterior or cerebral wall the dura mater was exposed over an area the size of a sixpence, the bone in this situation being destroyed. The sinus appeared to be of average dimensions, extending about half-way back along the orbital roof, while in its vertical direction it reached about three-quarters of an inch above the supra-orbital margin. The lining membrane of the cavity was thin and vascular, and did not present the appearance of a surface covered with granulations; it was very unlike the œdematous, almost polypoid character of the mucous membrane so frequently observed in cases of chronic suppuration of the frontal sinus. The normal communication with the nasal cavity could not be detected with the probe. An attempt was made to obliterate the cavity after curetting the lining membrane, but this did not prove successful. I therefore removed the middle turbinated bone, and made a large opening sufficient to admit the little finger between the sinus and the nasal cavity, and inserted a drainage tube through it. The condition was eventually cured, the eyeball returning to its natural position.

An examination of the fluid contained in the sinus was made by Dr. C. J. Lewis, who reported the presence of pus cells and streptococci in small numbers. Inoculation experiments proved the latter to be non-pathogenic.

Case 2.—*Mucocele of the right frontal sinus.*—C. S., female, æt. 43, was admitted into the Royal Infirmary on 6th April 1905, complaining of swelling over the right eye, and a heavy sensation in the same situation. The history obtained from the patient was that four years ago she had first noticed a small swelling in the inner and upper part of the right orbital cavity, which slowly increased in size, without causing her any inconvenience. She could ascribe no cause for it, nor was there any history of nasal trouble. A few months after noticing the swelling, she consulted Dr. George Mackay, who prescribed an ointment for local application, and iodide of potassium internally. During this treatment the swelling in the orbit became less. She returned, however, to Dr. Mackay in February 1905, when she was referred to me from the Eye Department.

On admission to the Ear and Throat Department in the month of April 1905, the right eye was found to be displaced forwards, downwards, and outwards (Plate VII. Fig. 1). The swelling lay beneath the middle and inner thirds of the right supra-orbital margin in the position of the floor of the frontal sinus. At its peripheral part it presented a hard bony feeling, there being considerable thickening, probably due to periostitis. The centre of the swelling, on the other hand, was soft and fluctuating over an area the size of the end of the little finger. On palpation, one obtained the distinct impression that there was a gap in the bone. There was no pulsation detected either on inspection or on palpation. The patient had no disturbance with her vision; no diplopia was complained of. There was an entire absence of pain or any acute inflammatory phenomena. Examination of the nose revealed nothing abnormal.

Under general anæsthesia, an incision was made along the line of the eyebrow, and when the soft parts were reflected downwards a clear serous-like fluid welled out. A large cavity, the right frontal sinus, had been opened into without the necessity of removing any bony wall. The fluid as it escaped pulsated markedly, as indeed did the whole eyeball. The frontal cavity passed for a very considerable distance upwards, also to the left across the mesial line, while its extension backwards along the roof of the orbit measured 1½ in. A considerable area of the bony floor of the sinus had been absorbed. The cerebral wall of the sinus also showed a large area—at least the size of half a crown—from which the bone had disappeared. The dura mater was plainly seen pulsating, a fact which accounted for the marked pulsation of the fluid contained in the frontal sinus. The lining membrane of the cavity was thin. It was decided to postpone for a few days the making of an opening into the nose. The sinus was therefore lightly packed with iodoform worsted. It was found necessary to change the dressings over the wound twice daily at first, owing to the copious flow of blood-stained fluid which saturated them.

After an interval of eight days the patient was again anæsthetised, and a large opening was made between the sinus and the nasal cavity, a drainage tube being passed through the opening. The after-treatment of the case presented no special points of interest. The external wound was allowed to close after ten days. The tube was maintained in position for six weeks, and then removed through the nostril, the patient being instructed to wash out the sinus by means of a curved cannula. Six months after the operation she reported that there was no discharge from the nose, and that her eye was in good position.

The fluid which escaped from the sinus in this case closely resembled in appearance cerebro-spinal fluid. Fehling's test applied during the operation was negative. From a culture made on agar, the *Staphylococcus pyogenes albus* was obtained. No chemical report was, unfortunately, obtained, but the fluid presented none of the physical characters of mucus.

Case 3.—*Mucocele of the right frontal sinus.*—C. K., a female, æt. 33, was admitted to the Ear and Throat Department on 18th April 1904, complaining of a more or less constant discharge from a small opening in the inner part of the right upper eyelid. The history obtained was as follows:—Eight years ago, in 1896, she had noticed a small swelling, the size of a pea, occupying the inner third of the right upper eyelid, just above the inner canthus. She did not suffer any pain; there was no discoloration of the skin; there was no nasal discharge. The swelling increased somewhat in size during the next three years, and some displacement of the eyeball was observed. She then consulted her medical attendant, who incised it. A thickish non-purulent fluid was evacuated. The wound, however, did not heal. Six months later a free incision was made under chloroform, and the contents of the cavity evacuated. The wound still remained unhealed, the patient neglecting to take any care of herself.

When admitted under my care, in April 1904, there was a small circular opening in the right upper eyelid situated immediately above and slightly external to the inner canthus. A granulation protruded through it and a drop of pus oozed out beneath the granulation. A slight swelling, which was of bony consistence, was observed above and internal to the canthus (Plate VII. Fig. 2). The eyeball was slightly displaced downwards, forwards, and outwards. A probe could be passed through the opening for a distance of three-quarters of an inch, and impinged upon bone covered with granulation tissue. On its withdrawal, a considerable quantity of pus oozed out. There was no pus seen in the right nasal cavity. The anterior end of the middle turbinated body was in contact with the septum, which was slightly deflected to the right. The uncinate process was visible, but there was no bulging of the ethmoid labyrinth into the cavity of the nose.

Under chloroform anæsthesia the anterior end of the right middle turbinated was removed. An incision was made in the line of the eyebrow, and the upper eyelid turned down; the floor of the frontal sinus with an opening in it, was in this way exposed. This opening was considerably enlarged by the removal of the greater part of the floor and a portion of the anterior wall of the sinus. The cavity, which was a frontal sinus of average dimensions, contained pus and granulation tissue, two short pieces of gauze, and a thin drainage tube rather more than 2 in. in length. The sinus was carefully curetted. The ostium frontale could not be found with a probe, so that it was necessary to make a large communication with the nasal cavity by the aid of the burr. A large drainage tube was inserted. The skin incision was accurately stitched, after packing the cavity with iodoform worsted, and bringing the end of it out through the old fistulous opening. A cure resulted without any incident of note.

Case 4.—*Mucocele of right frontal sinus.*—J. S., æt. 44, a golfgreen keeper, was admitted to the Royal Infirmary on 1st November 1905, complaining of a stiffness and swelling above the right eye, some discharge from both nostrils with obstruction on the right side, and impairment in the sense of smell. During the last two months he had also been conscious of seeing double. The history did not throw much light upon the etiology of the condition. The patient had always been a healthy man, but he suffered from typhoid fever five years before his admission. He had never had any lung trouble. For some years before the attack of typhoid fever he had suffered from severe pain over the right eye at intervals. In June of the present year his right eye commenced to water, especially after reading, and in August (that is about three months before his admission) he first noticed the displacement of the right eyeball. After his attacks of pain in the eye he would notice a slight discharge of somewhat thin watery secretion from the right nostril.

Examination revealed considerable proptosis of the right globe, with outward and downward displacement. The swelling in the orbit occupied the inner and part of the middle third of the upper lid, extending outwards to just beyond the supra-orbital foramen. It was soft and fluctuating. There was no discoloration of the skin. Examination of the nose showed an enlargement of the bulla ethmoidalis, the uncinate process being visible immediately below and external to it. There was no pus. Dr. W. G. Sym reported that there was no ocular paralysis, but that diplopia was present in both the vertical and horizontal planes. Vision was otherwise normal.

On 6th November an eyebrow incision was made, and the right frontal sinus was opened into without the necessity of removing any bone, as the whole of the floor of the sinus had been absorbed. The fluid which escaped was slightly opalescent and of a sticky, mucoid character. There was no absorption of the cerebral wall of the sinus, which was a cavity of more than moderate dimensions, the horizontal portion indeed extending backwards almost to the apex of the orbit. A probe was readily passed down through the ostium frontale into the nose. This opening was enlarged and a drainage tube inserted. The cavity was lightly packed with iodoform worsted, and the greater part of the skin incision was sutured. A fortnight after the operation the eyeball was in better position, and the patient no longer complained of double vision. The external wound was allowed to close, and the cavity was washed out by means of a cannula passed up through the drainage tube. The drainage tube was kept in the cavity from three to four months, the patient continuing to wash upwards through it. In April 1906 there was little or no disfigurement as the result of the operative procedure. He still complained of some discharge from the right nostril, but was otherwise well.

The examination of the fluid in this case was made by Dr. Stuart M'Donald, who reported that it consisted mainly of blood-stained mucus in which there were practically no cells or any bacteria. Cultures proved to be negative, no growth being obtained. Some caseous-looking material which was removed from the cavity close to the orifice of the sinus consisted of inspissated pus infiltrated with lime salts, apparently carbonates. There were also some degenerated leucocytes present. The lining membrane of the sinus was thin except in the neighbourhood of the ostium.

Case 5.—*Mucocele of the right frontal sinus.*—M. S., æt. 52, was seen with Dr. M'Bride on 23rd January 1907. There was little or no history bearing on the origin of the case. The patient had always considered herself as particularly free from nasal trouble. She had never been conscious of any discharge from the nose, and had received no injury. Apparently she had only noticed a swelling of the right upper eyelid for six weeks before she consulted Dr. George Mackay, who told her that there was no ocular trouble. There was no diplopia, no ocular paralysis, and no impaired vision; nor was any pain complained of.

When first seen by Dr. M'Bride there was merely some œdema of the right upper lid in its middle and inner thirds; this narrowed the palpebral fissure; no change could be noted in the deeper parts. There was no tenderness and no pain on palpation, nor had she been conscious of any discomfort in the right eye.

Examination of the right naris showed the middle turbinated region to be narrowed, the septum being deflected to the right with the middle turbinated pressed against it; there was no secretion visible in the middle meatus. At this time Dr. M'Bride could see the uncinate process. The left nasal cavity presented no abnormal appearances. Five weeks later there could be detected, in addition to the œdema, a soft semi-fluctuating swelling occupying the outer part of the inner third and the inner part of the middle third of the orbital roof. It lay altogether below the supra-orbital margin. There was no discoloration of the skin, and no pain on palpation. There was no thin bony wall covering the softer area, careful palpation giving the impression that a defined bony edge could be detected at its periphery. There was no periosteal thickening round about it. The soft swelling gave the impression that the floor of the frontal sinus had given way.

The illumination of the right side showed a larger sinus area than on the left, and the intensity of the former was rather greater than on the left side.

The outer wall of the middle meatus now bulged slightly into the nasal cavity, making it impossible to pass the thin blade of a pair of Luc's forceps or the wire of a snare between it and the middle turbinated. There was no abnormal secretion.

On 23rd January an external operation was performed. An incision was made through the soft parts immediately below and parallel to the right eyebrow; through this there welled a greenish-brown, thick slimy fluid; after turning down the upper eyelid, a large aperture was found in the floor of the frontal sinus; indeed, with the exception of a narrow ledge of bone forming the most posterior and deepest part of the floor, the lower wall had been absorbed. The aperture was at least the size of a shilling, and was bounded anteriorly by the supra-orbital margin. The sinus was of more than average size, its dimensions corresponding very accurately to the area of illumination. Notwithstanding the thick consistence of the fluid, the illumination was good. There was no absorption of bone on the cerebral wall of the sinus; there was no pulsation of the fluid as it escaped. The lining membrane of the cavity was rather thicker than what is usually seen in these cases, and gave the appearance of being slightly inflamed.

The opening in the floor was enlarged in the direction of the ostium frontale, and a small portion of the anterior wall of the sinus was also removed to facilitate after-treatment. The lining membrane was not interfered with. The ostium frontale could not be found with the probe, so that it was necessary to force an opening into the nose by means of burrs.

A drainage tube was passed down into the nasal cavity; the external wound was closed with the exception of the inner third, through which was brought the end of a gauze packing. The after-treatment consisted in washing out the cavity daily through the inner end of the skin incision for a fortnight. The wound was then allowed to close. The drainage tube was kept in the ostium of the sinus for six weeks, irrigation being carried out through it. At the end of this period there was merely a trace of discharge, which finally disappeared.

CASE 6.—*Mucocele of the right frontal sinus.*—Mrs. C., æt. 51, was recommended to the Ear and Throat Department by Mr. George Berry on 14th June 1905. She complained of a swelling above the right eye, slight pain, and double vision. The history obtained was that she had been struck above the right eye by a cap which was thrown at her. The accident occurred five or six months before her admission, and was followed by the swelling now noticed above the right eye. The patient was certain that there was nothing of this kind visible before the accident. Occasionally she had had slight discharge of mucus from the right nostril, but it was not followed by any change in the size of the swelling.

Below the inner third of the right supra-orbital margin, and occupying the upper and inner angle of the orbit, there was a swelling. The skin covering it was not discoloured; there was no tenderness. On palpation it presented a somewhat tense elastic feeling, but fluctuation could be detected. The eyeball was slightly displaced downwards and outwards. Dr. W. G. Sym reported that there was some fulness of the veins of the disc on the right side. He did not regard the diplopia which the patient complained of as being due to weakness of the right superior oblique muscle. Examination of the nose showed very little that was abnormal. There was slight deflection of the septum to the right; the middle turbinated body was not enlarged; there was no pus, nor were any polypi visible.

The right middle turbinated was removed under local anæsthesia, and on 16th June an external operation was performed. A curved incision through the soft parts was followed by an escape of bad-smelling yellowish-green pus. The floor of the frontal sinus was found completely absorbed, there being no bone left below the supra-orbital margin. There was no absorption of bone either in the posterior or anterior wall of the sinus. A probe could be readily passed down into the nose through the normal opening. This was enlarged, and a drainage tube inserted through it into the nasal cavity. The sinus was one of average dimensions.

During the after-treatment the drainage tube was prematurely removed and had to be reinserted from above through the sinus, as it was found impossible to wash out the cavity by way of the nose without it. At a later date the tube was removed, and the patient taught to wash out the sinus by means of a cannula passed through the nostril. After a few months of treatment, the condition was cured.

The fluid, which was undoubtedly purulent, was found to contain some very minute cocci, some in pairs, others in chains, and a number of irregularly staining bacilli. A culture examined after forty-eight hours' incubation contained no cocci, but a large and pure growth of a bacillus indistinguishable from the Klebs-Löffler bacillus was present.

Exception might possibly be taken to the inclusion of this case under the above title. We are of opinion, however, that it may justly be included, and that it is an example of a mucocele the contents of which had become secondarily infected. The possibility of such was increased by the patent condition of the ostium frontale. The blow from the soft cap was not an etiological factor, but served to draw the patient's attention to her eye. The absence of all acute inflammatory phenomena, the negative character of the nasal examination and the complete absorption of the bony floor of the sinus lead us to classify this case along with the others described in this paper, on account of the similarity which it presents to them in its clinical features.

CASE 7.—*Mucocele of the left frontal sinus.*[1]—C. H., a married woman, æt. 28, was sent to me in October 1901, at the Eye, Ear, and Throat Infirmary, by Dr. G. W. Sym, whom she had consulted on account of a swelling in the inner angle of the left orbit. She had first noticed it about nine months before seeking for advice. It had slowly increased in size, but had never caused her any pain or inconvenience, with the exception of what was associated with the displacement of the eyeball. With the gradual increase in the size of the swelling, the left eyeball had become displaced forwards, outwards, and slightly downwards, and a certain degree of diplopia or double vision was then complained of. At no time, either before the appearance of the swelling or since it was first noticed, was there any discharge from the left side of the nose; there was no interference with nasal respiration.

On examination, one was struck with the amount of protrusion of the left eyeball. The exophthalmos was the most marked feature in the case, as the swelling in the upper and inner angle of the orbit was only slightly visible on inspection. There was no discoloration of the skin. About 5 mm. below the inner third of the supra-orbital margin, in the area corresponding to the thinnest part of the floor of the frontal sinus and extending downwards to the inner canthus, there could be felt a small oblong swelling. It was impossible from its small size to palpate it with more than the end of one finger. It was of a soft, semi-solid consistence, yielding slightly on pressure, but no crackling sensation could be detected. Manipulation caused no tenderness. It was difficult to estimate how far the swelling extended backwards along the roof of the orbit. Transillumination of the frontal sinus was not practised.

Rhinoscopic examination gave negative results; there was no trace of pus or any secretion in the middle meatus, or indeed in the left nasal cavity. There were no polypi and no thickening of the nasal mucous membrane or enlargement of the middle turbinated bone. The absence of any abnormal intranasal condition was in keeping with the patient's own statement regarding her freedom from nasal symptoms. Ophthalmoscopic examination was also negative, and with the exception of the diplopia there was no interference with vision.

The case was regarded as probably one of distension of the frontal sinus with accumulation of mucus within the cavity, and it was decided to explore with the object of ascertaining the exact nature of the condition. Under chloroform anæsthesia an incision was made immediately below the inner third of the left supra-orbital margin, and carried downwards to the inner canthus. The soft parts having been retracted and the bone exposed, a portion of the anterior wall of the sinus was removed. The bone appeared thin, but there was no reason to suppose that it was otherwise than of normal structure. A white membrane, closely resembling the dura mater in appearance, was exposed; through an opening made in this there escaped a small amount of clear fluid, not unlike cerebro-spinal fluid. On incising the membrane further, a quantity of thick, tenacious, opalescent white fluid, not unlike soft brain matter, was evacuated. A larger area of bone, including that portion which formed the swelling in the orbital roof and which consisted of the thinned bony floor of the frontal sinus, was also removed. The same mucoid-like fluid continued to well out in great quantity; it in no way resembled pus. A probe could now be passed backwards into the cavity for a distance of nearly 2 in. along the roof of the orbit, apparently reaching as far as the apex of that space. In an upward and outward direction the probe passed into the vertical portion of the frontal bone, and the extent of the cavity in this situation appeared to be greater than what we are in the habit of regarding as a sinus of average dimensions. There was no absorption of bone in any of the walls of the sinus. No communication could be obtained by means of the probe with the nasal cavity; consequently it was decided to make no attempt, in the meantime at any rate, to establish one. The lining membrane of the sinus hardly appeared to be altered, forming a very thin structure. It was carefully curetted, and the cavity was then packed with iodoform worsted, the end of the dressing being brought out through the external opening, which was sutured in its outer part. So large was the cavity that it was possible to introduce from 4 to 5 ft. of worsted dressing.

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[1] Published in the *Edin. Med. Journ.*, December 1903.

Great improvement in the position of the eyeball immediately followed the operation. The external strabismus disappeared, although some protrusion of the globe still remained. In the course of a little time it became evident that satisfactory healing would not take place, consequently a second operation was performed. A large opening was then made into the nose; the eyebrow incision was allowed to heal in a few days, and irrigation of the cavity was carried out for a considerable time through the nose until all discharge had ceased. The patient reported herself in June 1903. The orbital swelling had disappeared, the axis of the eyeball was correct, and vision was normal. A small scar and some tucking in of the skin in the line of the cicatrix was the only evidence of previous interference (Plate VII. Fig. 3). There was no nasal discharge.

The fluid evacuated was unfortunately not preserved for examination in this case.

CASE 8.—*Mucocele of the right ethmoidal labyrinth.*[1]—J. S., æt. 18, was admitted to the Royal Infirmary in June 1903, complaining of a swelling at the inner angle of the right eye. He stated that, about eighteen months before admission, he had noticed a small lump about the size of a pea in this situation, and that it had gradually increased until it had reached the size of a bean. It had never caused him any pain or the slightest inconvenience. At a later period than that at which the orbital swelling was first noticed, he was conscious of some discharge from the right side of the nose, a condition which was not present on the left side. He described it as being like pus, but the history with regard to this point is somewhat indefinite.

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[1] This case was published in part in the *Edin. Med. Journ.* for November 1903.

Examination of the patient showed that a small swelling occupied the inner third of the right upper eyelid, immediately above the inner canthus (Plate VII., Fig. 4). The skin covering it was of normal appearance and was freely movable upon it. At its anterior part the swelling was firm to the touch and apparently of osseous consistence; it formed in this situation a vertical ridge, which was somewhat sharply defined. Behind and external to this a semi-fluctuating elastic sensation was readily obtained on palpation, which did not produce any pain.

The eye movements and the vision were perfectly normal, and there was no proptosis noticeable, nor was the globe displaced in any direction. Examination of the right nasal cavity did not reveal any abnormal condition. There was no purulent or muco-purulent discharge. The right middle turbinated bone was somewhat larger than its fellow on the opposite side, but its size was not inconsistent with a normal condition; its appearance did not suggest any cystic distension. The mucous membrane covering the middle turbinated was slightly thickened, and lay in contact with the outer wall of the middle meatus. Transillumination of the sinuses gave the following appearances:—The right antrum and right frontal sinus failed to transmit the light, while the left antrum and left frontal sinus were brilliantly illuminated.

Mr. Berry, under whose care the patient was at that time, decided to open the orbital swelling. This was done through the fluctuating area, and the knife at once entered a cavity without encountering bone. There escaped from the opening thus made a quantity of somewhat sticky, white, opalescent fluid resembling the contents of a mucous cyst. There were no glistening particles observed in the fluid, such as one notices when cholesterin crystals are present. The probe passed into a bony cavity of very considerable dimensions, which extended both in the direction of the nasal chamber and also into the roof of the orbit. In this latter situation, the probe passed outwards and backwards for a distance of nearly 2 in. along the orbital roof. It could not be directed upwards towards the frontal sinus.

There was a slight mucous discharge from the wound for a few days; the orbital swelling for the most part disappeared, but the bony ridge, which we have described as lying anteriorly, persisted. Microscopic examination of the fluid showed that it consisted almost entirely of mucus, no pus cells being detected, nor were any cholesterin crystals found. No bacteriological examination of the fluid was made.

In this case the mucoid character of the contents of the cavity and its situation and limitations justified us in considering it to be a mucocele of the anterior ethmoid cell labyrinth. The fact that the probe could not be passed upwards into the vertical portion of the frontal bone in the region of the frontal sinus excluded the participation of that cavity. The marked extension of the bony cavity into the roof of the orbit was quite consistent with the normal anatomy of the ethmoidal air cells in a certain proportion of skulls.

Some months later the swelling again formed in the inner angle of the orbit. At this time the outer wall of the middle meatus bulged somewhat into the lumen of the nasal cavity. By means of forceps a portion of the nasal wall of the ethmoidal labyrinth was removed. This was followed by an escape of thick mucoid fluid and the disappearance of the orbital swelling. There has been no recurrence.

Case 9.—*Mucocele of the right ethmoidal labyrinth.*—A. T., æt. 17 years, was admitted into the Royal Infirmary in October 1905. The following history was obtained. At the age of 10 she had had scarlet fever, which was complicated with suppuration in both middle ears. Two years later she began to be troubled with tears running over the right cheek, and she noticed at the same time that the right side of the nose became blocked. A probe at that time was passed down the tear duct, but shortly after this a swelling showed itself at the inner canthus of the right eye. No further treatment was sought until two years later, when she again had probes passed down the tear duct, and indeed one was kept in the duct for six months. The obstruction in the right nostril had passed off, but had been followed by a good deal of nasal discharge.

Examination of the patient revealed the presence of a swelling in the region of the right inner canthus. There was no discoloration of the skin. The swelling was of hard, bony consistence, save at its most prominent part, where there was a soft fluctuating area. There was no displacement of the eyeball, nor did she complain of any visual trouble. Examination of the nose showed that the interval between the right middle turbinated and the outer wall of the middle meatus was filled up by a bony swelling which projected downwards and inwards. The probe could not find any entrance in this situation. There was no pus visible either on anterior or posterior rhinoscopy.

Under local anæsthesia, Dr. M'Kenzie Johnston made an opening through the nose into the bulging area above described by means of Grünwald's forceps, and a considerable quantity of non-purulent fluid was evacuated. At a later date, in Dr. Johnston's absence, owing to the persistence of the orbital swelling, I made an incision beneath the right supra-orbital margin, and turned down the upper lid structures. A small opening about the size of a sixpence was found in the bony wall of the ethmoid labyrinth, and a probe passed through it entered a cavity about the size of a partridge's egg. This cavity was apparently limited to the anterior ethmoidal region, as the probe could not be passed upwards behind the supra-orbital margin. The opening in the bone was considerably enlarged by means of forceps. The lining of the cavity was scraped and a large opening made into the nose, through which a drainage tube was passed. The secretion evacuated presented a somewhat opaque appearance and was gelatinous in consistence, and did not give the appearance of pus. Microscopical examination showed that it contained a little fibrin and clusters of polymorpho-nuclear cells and a few mononuclear cells; no pus cells were present. The skin incision was not completely sutured, a small piece of gauze being inserted at one end. After removal of this, however, a fortnight later, the wound closed and the patient was taught to wash out the cavity through the tube in the nose. After removal of the nasal tube at the end of another month, she was able to wash the cavity out by means of a curved cannula. A year after the operation the patient reported herself as very well; there was no nasal discharge and no longer any swelling in the orbit.

CASE 10.—*Mucocele of the left ethmoidal labyrinth.*—W. R., æt. 19, first noticed a hard swelling at the inner angle of the left orbit nine years before admission to the Royal Infirmary. He consulted Mr. George Berry one year after the swelling appeared. It was then punctured, and, according to the patient's statement, fluid was evacuated. At that time he did not complain of any difficulty in his sight. When seen by me on 30th March 1905, eight years after his visit to Mr. Berry, the left eye was found to be considerably proptosed and also displaced outwards and somewhat downwards (Plate VII. Fig. 5). The swelling, which had never disappeared from the inner angle of the orbit, had increased markedly during the previous four days, and there was very considerable œdema of both upper and lower eyelids, with reddening of the skin. On palpation the swelling was painful, of soft consistence, and fluctuating. It was evident that an abscess had formed in the orbital fossa.

Examination of the left nasal chamber revealed the presence of a large globular-like middle turbinated filling up the nasal cavity to a considerable extent, and making it impossible to see the outer wall of the middle meatus. There was no pus seen in the nasal cavity. The right nasal chamber showed no abnormality, and there was nothing pathological to be noted on posterior rhinoscopy.

Under cocaine and adrenalin anæsthesia the left middle turbinated was removed; this was followed by a copious flow of pus, and when pressure was made upon the orbital swelling externally, there was an increased flow of discharge into the nose, and diminution in the size of the external swelling. Under a general anæsthetic, a curved incision was made just below the left orbital margin down to the periosteum. An abscess cavity was opened, and on investigation it was found that a large opening existed in the inner bony wall of the orbit. The lachrymal bone and almost the whole of the os planum of the ethmoid was found to be wanting. The finger passed upwards through the nose readily reached this aperture in the bone. The ethmoid cell labyrinth appeared to have been converted into one large abscess cavity. There did not appear to be any evidence of a left frontal sinus; after curetting, a large drainage tube was passed down into the nose. The incision in the skin was sutured in part, some gauze packing being left at one end of the wound, and dressings were applied.

At first the after-treatment was carried out through the external wound, the abscess cavity being syringed out daily, but later the incision was allowed to close, all further treatment being carried out from the nasal side. After removal of the drainage tube at a later date, it was found necessary to remove more of the bony wall of the ethmoidal labyrinth by way of the nose, as the nasal opening had tended to close. Eventually a cure was obtained.

We must regard this case as one of long-standing mucocele of the ethmoid labyrinth, which had become acutely inflamed a few days before the patient's admission to hospital. The pain, with œdema and redness of the upper eyelid, was of sudden onset, and contrasted markedly with the condition which had existed for so many years.

(*To be continued.*)

LOOKING BACK: 1907–1860.

By JOHN CHIENE, C.B., *Professor of Surgery, University of Edinburgh.*

"EXTREME busyness, whether at school or college, kirk or market, is a symptom of deficient vitality, and a faculty for idleness implies a catholic appetite and a strong sense of personal identity." If we "would whistle more and argue less," the world would be a better world.

These things I learned from my friend Robert Louis Stevenson, and I now thank him for them. Horses fresh from the grass (and that is our present state) cannot be trusted, and should not be asked, to do a hard day's work. A colleague of mine once told me that he could not afford to lose a day with the trivialities of an Introductory. Another colleague spoke of one of mine as not bad—high praise from a Scot—but he could not see what it had to do with surgery. I answered, "A surgeon must be a man, and a good man too, before he can be a good surgeon." I am here, if it be possible, to make men who will be good surgeons; I believe with Herbert Spencer that education, to be profitable, must be pleasurable. An abrupt dive into the process of Repair is not conducive to longevity; Lubbock says, "The most important thing to learn in life is how to live," if you add "happily," then I agree with him.

Forty years ago, in the end of February 1867, my dear Master, John Goodsir, sent for me, his Junior Demonstrator of Anatomy, to his house at Wardie, off the Granton Road. I found him lying on a camp bed in a narrow room (in which, I understand, Edward Forbes died), a small table at his side, and on the table his Bible and Quain's "Anatomy." He asked me how his students were getting on, and bade me farewell. His last words were, "Teach my students, Dr. Chiene. Good-bye." He died shortly afterwards, on the 6th of March, and I have taken these words as my life-motto. William Turner succeeded him, and did me the honour of appointing me his Senior Demonstrator of Anatomy, the position he had held under Goodsir. From that day to this my lifework has been among you, and to-day, when I celebrate my Silver Wedding as Professor, I take as my subject—

LOOKING BACK.

After graduating in 1865, I spent a year in the Hospital as Mr. Syme's House Surgeon. In November 1866, Mr. Goodsir made me one of his Demonstrators, and, as I have said, I became Senior Demonstrator in 1867.

Looking at the list of my fellow-students, I see that ten graduated with honours. I don't say that they were the best students. Three—G. R. Barnes, Thomas Blunt, and Peter Macpherson—I have not been able to trace. One, my friend Lachlan Aitken, died when assistant to Sir J. Y. Simpson,—a young life full of promise, cut off at the beginning of what would have been a successful career.

Six remain to this day: Andrew James Duncan, Consulting Physician, Royal Infirmary, Dundee; William Allan Jamieson, long your teacher of Diseases of the Skin in the Edinburgh Royal Infirmary, now a Consulting Physician to that institution; John Aymers MacDougall, once Surgeon to the Carlisle Infirmary, now "facile princeps" as the Surgeon of the Riviera, resident in Cannes; J. Murray Moore, Liverpool; John Wyllie, your Professor of Medicine, the only man who graduated with honours and obtained a gold medal for his thesis (his brother medallists were John Barclay Clerk and William Henry Lightbody); and lastly, your Professor of Surgery, who now addresses you.

I have one vivid recollection of my term of office as Senior Demonstrator of Anatomy. Professor Turner sent for me at three o'clock one afternoon and asked me to give the four o'clock demonstrations. I felt nervous, and went downstairs to Mr. Stirling's little den on the ground floor (it is now swallowed up in the Examination Hall) to get comfort and company. I went into the anatomy theatre, forgot to turn up the gas, and delivered the demonstration in the semi-darkness. The students were kindly fellows—they never by word or sign pointed out my omission. I only found it out next day.

After three years in daily contact with Professor Turner, now Sir William Turner, your Principal—you know what that means to a young man—Mr. Annandale, desiring to devote himself to clinical teaching (in those days an Infirmary Surgeon could not give two qualifying courses on Systematic and Clinical Surgery), very kindly in May 1870 offered me the Summer Operative Course at Old Minto House, where Mr. Syme performed the historic operation on "Ailie," described by Dr. John Brown in "Rab and his Friends." Stevenson says Brown "didnae fash himsel' to think,"

"Ye stapped yer pen into the ink,
And there was Rab."

In that course I introduced two things that I had never seen before in a lecture room—coloured chalks and a naked man, the former for the blackboard, the latter for teaching external anatomy. I lectured to twenty-eight students. In 1871 I began a systematic course, but the formation of Chambers Street (then called North College Street) drove Matthews Duncan, Claud Muirhead, and myself to pastures new; we found a resting-place in the dwelling-house, 27 Nicolson Square. Thirteen students attended my systematic class in 1872, but the summer class of fifty-five in 1873 (operative surgery was not compulsory until 1892) was too much for the dining-room in which the lectures were delivered, and I was driven to build, with the help of my fellow-lecturers, that ornate building still in existence. It cost £200. It was to a great extent put up between a Friday at midday and the following Tuesday morning. I feared the Dean of Guild Court, but that body made no sign, for which I am to this day thankful, because it would have been difficult for anyone to speak to its architectural beauty. Something might surely be done to hide its ugliness. I have always when possible taken a deep interest in the amenities of the ancient square, because my grandfather lived in No. 4. I believe in ancestral worship. I have often heard my mother say that as a girl she often danced in No. 27, when Mr. Sibbald, afterwards Sir John Sibbald, Lord Provost of Edinburgh, lived there.

Peter Bowie was our doorkeeper, a kindly gentleman, and a most respectable man; he kept canaries and won prizes, played dominoes in public-houses, and knocked on the table with his eye when he wanted more beer. He made money by betting with ignorant and confiding strangers that he could call the waiter by knocking with his eye on the table. It was a glass one; he used it so roughly that I think it must really have been made of gun-metal. He was once in the army, and in a battle in the "distressful country" he had to charge with fixed bayonet, and against his will push his bayonet into the "behind"[1] of a citizen whose discretion overbalanced his patriotism. (Marcus Aurelius says "No man does wrong willingly.") To his dying day Peter regretted his action, feeling like Laotze that "he who conquers feels the pity of it."

What a flood of memories centre round doorkeepers and dissecting-room porters! John Brown's "Jeems" leads the way, "Robert" at the College of Surgeons lecture room—a beadle on Sunday (I sat under him in the Free Church in Henderson Row), and on that day butter would not melt in his mouth. His week-day frame of mind was altogether different—a common failing, you will say. I attended in the class-room behind the College of Surgeons the best systematic lecturer I ever listened to, Daniel R. Haldane. I have one regret about the building, that I never heard Sir Henry Littlejohn lecture. I once gave the introductory lecture in *his* class-room, in 1875. In those days the extra-mural school was opened by an introductory lecture.

Then "Kitty," "James's" wife, with her sad but beautiful face, an expression due to her good husband's one frailty. I was his surgeon, and a sense of professional reticence prevents my telling you the particulars of his case, but it came ultimately to this, I performed on James my first "major" operation. He recovered.

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[1] See Lord Dufferin's "Recollections."

Mr. Spence had in prehistoric times a porter termed Cumming; he had chronic rheumatic arthritis of his hip and many failings. Mr. Spence bore the failings patiently, waiting until the end came, when he obtained the hip joint. I show it now. You are fortunate in the fact that Mr. Spence's museum is still in this building in daily use. That hip joint has been a source of anxiety to generations of students in the orals. Take a good look at it.

I visited the old class-room the other day, and it recalled old memories. The class-room became in its turn crowded, and I added a gallery, which still exists, but even with that addition I had again to flit to a large hall below a new church in Chambers Street, and I then got into New Minto House, where I stayed till 1882. Even there I had to add new seats.

I think of many things in these days, but I must restrain myself. I have put my experiences as an extra-mural teacher on record, because I see signs that men are not now making teaching their lifework. They aim more at practice, on the plea that they must live (I don't wish to deny the necessity), but I lived by my teaching, and became Professor because I was successful as a teacher. No merit on my part—I simply followed the advice of Sir Robert Christison when I called to thank him for proposing me as Assistant Surgeon (Sir George Harrison seconded me). He said, "Teach, Dr. Chiene, and the practice will follow." "Don't teach to get practice, but teach for teaching's sake." I had in twelve years 1432 students; my largest winter class was in 1879, 155 students; the largest operative summer course 88, in 1882.

During my tenure of office as Surgeon I have had sixty-six house surgeons. Fourteen are now hospital surgeons; twenty-one are busy practitioners, many of them consultants; one is the head of a large asylum. Four are in the army, four are professors, six are dead, and sixteen are unaccounted for. The majority of these are recent holders of office who have yet their way to make. I have three regrets; but I have been wonderfully helped, for which I now thank them. I have had 906 clerks and 1903 dressers. To my instrument clerks I pay a very special tribute of thanksgiving; the amount of trouble these men take, and the care that is necessary in these days, indicate a zeal and knowledge which I cannot overestimate.

The turning-point in my surgical training was in the spring of 1866, when I was introduced by Mr. Syme to his son-in-law, Joseph Lister, who was then Professor of Surgery in Glasgow. He shook me cordially by the hand, and that grasp—I still remember it—fixed me. From the day he came to Edinburgh in 1869 as

Mr. Syme's successor in the Clinical Chair, until he went to King's College, London, in 1878, I spent daily two hours in his wards—on Sunday afternoons often three or four hours. Lister went to church in the morning, and visited the Infirmary in the afternoon. I have repeatedly, in season and out of season, spoken of those days when I saw him at his daily work elaborating with zeal and patience and doggedness that imperishable system which he has been privileged to see an accepted fact. When I knew him he could count his disciples on the fingers of both hands. Don't mind that red herring drawn across the path called aseptic surgery. Boiling water is as much an antiseptic as carbolic acid. Asepsis is the result, antisepsis is the moving spirit; antisepsis is the Tao, asepsis is the Teh of Laotze.

In October 1871 I was elected Junior Assistant Surgeon in the Royal Infirmary, in succession to my lifelong friend the late John Duncan, that philosophic surgeon whose Clinical Lectures with their wide grasp of principles will ever remain a fond memory amongst his pupils. In his latter years he took, as only middle-aged men can, greedily to golf, and he joined a gang of hardened old golfers who frequented Musselburgh and afterwards Old Luffness. He more than held his own, in spite of many peculiarities. We called him Elijah, because on one occasion he played a round in his ulster and his boots, until his clothes were dried. He approached with a niblick, and however far he was from the hole on the putting green, he invariably expressed astonishment if his putt did not go in. He had one excellent law—we called it Duncan's Law—illustrating the wisdom of the man. "When you lose your ball and do not find it where you thought it was, go thirty yards back and you will find it." I have used Duncan's Law ever since: it is as invariable as one of Newton's Laws.

I received £50 for cabs to take me to the Convalescent Hospital at Corstorphine. This enabled me to give my wife and children carriage exercise, a merciful dispensation of Providence for all concerned. It was certainly the only way they could have got it. I had also charge of the Lock wards, and I never had a better behaved body of patients.

In the summer of 1875, Mr. Lister went to the Continent, and kindly gave me his wards and clinical lectures. I had five clerks (Thos. H. Watson, A. Emyrs Jones, G. Sims Woodhead, David Berry Hart, and James Scott), and nine dressers (William Oliphant, John Stewart, Alex. Hendry, W. C. Lawson, Nathan Murdoch, Roger M'Neill, Francis M. Caird, De la Vera, Henry D. R. Kingston). Mr. George Rice, M.B., C.M., was House Surgeon.

It must have been a disappointment to Dr. Rice to have me as his chief, but I have never forgotten his kindly courtesy to me personally, giving me every help. Lister had many good residents; I remember more particularly W. J. Fleming, most loyal to me, who died some years ago in Glasgow; George T. Beatson and T. R. Ronaldson, both now busy men, one in Glasgow and the other in Edinburgh. They have been my close friends ever since.

In November 1877, Mr. John Duncan got wards, and I was elected Senior Assistant Surgeon. In March 1878, when Mr. Lister went to London, I was appointed Junior Surgeon. I worked in the Old Infirmary until October 1879, when the New Infirmary was opened. I had twenty-two beds in Ward 4, with siderooms, until July 1882, when I went to Wards 13 and 14, where I have since remained. Mr. Spence chose these wards because he believed that pyæmia was more frequently met with in wards near the ground; his maxim was the higher up the safer you are. Pasteur had recently shown that high Alpine air was sterile. Mr. Spence had reason for the faith he had in the safety of high altitudes.

When I look back on the work in the early eighties and compare it with the work now, 1878–1885 with 1899–1906, the comparison is of interest. I have taken seven years (the biblical number) to give a sufficiently wide range, my first seven years compared with the last seven completed years. Mr. Sydney Champtaloup has extracted the cases for these two terms. I have not time to give the full particulars, but the essence is that in the first period 752 operations were performed, 107·5 per annum; in the latter period, twenty-five years afterwards, 2805 operations, 400·5 per annum. Doubtless I had ten fewer beds during the first period, but still that will not account for the difference. In the first period there were only 241 beds in the whole surgical house; now there are 379.

The amputations are practically the same, 107 to 118. The excisions of joints are nearly doubled, 58 to 108. Excision of mammæ more than doubled, 40 to 101. Tumours trebled, 114 to 353. Abdominal surgery in the first period consisted in one case of intestinal obstruction due to an adherent Meckel's diverticulum, as compared with 429 laparotomies, 210 of which were operations on the appendix. The first appendectomy was done in 1893; the rush began in 1901, and came to a head in 1904. Why this flood? This is one of the unsolved problems which are a reason for your happiness. You have something to clear up. Would that some one of my hearers would do so! Operations on veins, 5 to 109; operations on nerves, 19 to 33; genito-urinary surgery, 50 to 321; hernia, radical cure, 21 to 233; strangulated hernia, 7 to 29.

These figures are interesting as showing the great increase in surgical work that has taken place during the last twenty-five years. Mr. Scott Carmichael, F.R.C.S., Surgical Registrar, has written a very interesting paper comparing 1850 with 1900.[1] I have taken the general mortality over the two periods, and I find that the percentage of deaths was 7·2 between 1878–1885, in the latter period, 1899–1906, it was 6·7 per cent. These figures include all operations, and no allowance has been made for deaths occurring within twenty-four hours after admission.

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[1] *Scottish Med. and Surg. Journ.*, 1902, August.

My class assistants, twenty-three in number, have with few exceptions been good men and true. I did all my tutorial work myself for some years. Mr. Caird was my first house surgeon and class assistant, and afterwards my private assistant. He served me faithfully. James Gray is dead; he was at the time of his death Assistant Surgeon in Dundee Infirmary—a young life cut off suddenly. *Requiescat in pace.* Thomas Fraser is also dead, and I verily believe that I never had a gentler or kinder assistant. I loved him as a brother. He left me his notes of his University lectures all beautifully bound. "Honour your teacher and cherish his material" (Laotze). I learned much more from him than I taught him. He is buried in the Grange Cemetery, but he is still here to-day strengthening and encouraging me.

Mr. Stiles worked with me for ten years, from October 1890 to October 1900. He did my work—and he did it well—when I was in Africa.

In those years each professor had to pay his assistants, and at first I had several assistants, because I started (1882) what I believe to be the first teaching Bacteriological Laboratory in the United Kingdom. When the new regulations became law in 1902, the teaching of bacteriology passed very properly into the hands of my friend the Professor of Pathology. Now, in the laboratory we have always one or two faithful followers in the quest after truth. They are a strength to me.

I have had five staff nurses—Nurses Hendry, Hamilton-Ramsay, Law, Constable, and Cumming. They are now called Sisters, a term I have never liked. I look on them as the centre of the ward, round which we all rotate like satellites round a planet. They could truly say of house surgeons and dressers, "Men may work and men may go, but I go on for ever." I think also to-day of three nurses who helped me in private—Nurse Snow, now Mrs. Milne Murray, the widow of my dear friend the late Dr. Milne Murray; Nurse M'Cosh Smith, now Mrs. Ross, the wife of the head lighthouse-keeper on the Isle of May, where she now nurses the gulls; and Nurse Dewar, who for many years was in charge of my nursing-home in Chalmers Street. She died two years ago, leaving a blank which will not be easily filled up. There is one nurse now in the Royal Infirmary who is to me the spirit of all goodness; whenever I am specially down, I make some excuse to see a patient in her ward, where she rules so wisely, kindly, and well. The authorities in the nursing world presumably know what is best for their nurses, but to call a nurse a sister does not to my mind strengthen her position. It is said that in this we follow England—putting the cart before the horse. What about

Shakespeare and Robert Louis Stevenson, have you ever read of their love of nurses? Might I tell you that next to my mother I owe most to my old Highland nurse, Kate M'Arthur? Dear old lady, with her Bible and her handkerchief and her sprig of appleringie, with her love of hunting for mushrooms (she had a cat which used to point the mushrooms like a dog does a partridge), with her desire for "crottle" to dye shawls with! I was made to climb trees for it, and then, grasping tightly with arms and legs, I was taught to slide down. By the time I reached the ground my kilt was where it should not be, but the "crottle" was safe in her apron. She was a Free Church woman, but she always gave us potatoes and milk on Fridays; she must have had a Catholic ancestor; perhaps St. Columba on his way to Iona from Ireland dropped a follower on Islay, her native place. I could speak Gaelic before I could speak English. There is a family tradition that I said my prayers in Gaelic, continuing to do so long after I left the Highlands in 1847.

Think of Mrs. Porter and Mrs. Lambert being called sisters—they would have knocked you down. Who will ever forget Mrs. Lambert's cap when she brought in the "Ailies" to be operated on for scirrhus, and placed them gently on the operating table? Mr. Syme standing by with that kindly twinkle in his eye, so different from the stormy cloud that sometimes appeared when he felt annoyed. He could not, like St. Paul, "bear fools gladly." It is a great faculty; cultivate it for your peace of mind Marcus Aurelius has it, "Be not offended with idiots." Robert Louis Stevenson says, "I cannot bear idiots." I prefer St. Paul's version; he has joy, the others seem to suffer, in bearing idiots.

Then Mrs. Porter, the nurse of nurses, standing with the tin basin ready and watchful in cases of retention, always ready to help a humble resident; woe betide a conceited one—the wise man followed the way of least resistance and hid any little knowledge he thought he had; he leant on Mrs. Porter, and she was his mainstay and took care of him like a mother nursing her one chicken. People speak as if good nursing is a new art; it is a bad day for a country when home influences diminish in power. Home nursing is becoming a lost art; give me a mother's care, what more do I want? List slippers, commonsense, sympathy are the nurse's triangle. There are many—very many—good nurses, but beware of the frolicsome nurse, the unfulfilled-destiny nurse, and above all the ideal nurse. The last has generally one ideal, and he is generally a tin one—beware of her, young and perhaps old practitioners, I say beware. I think you will find the solution of the nursing question on pp. 224–227 of Professor James's "Talk to Students."

Looking back, I like to think of the students who have been my pupils, both extra-mural and intra-mural. I do not believe that there is a town of any size in this country or in the colonies in which I would not find a pupil. I have met them in Africa and Canada, and if ever I visit Australasia I will there have friends—my old students are my friends. The responsibilities have been great, the performance of the duties has been often, very often, faulty, and has left much to be desired, but it has been a happy life, and amongst many regrets due to my imperfections, manifest and palpable to myself at any rate, I have much to be thankful for. As long as strength is given me, so long it will be my endeavour to prove myself in some sense worthy of the high position which I attained in 1882. As years go on, as much work cannot be done, but this I will say, if anything must go to the wall it will not be at the expense of my lifework—teaching students the principles of Surgery.

I have had my happinesses, good house surgeons, good nurses, good instrument clerks, and earnest dressers; many Gallios, who had not grasped their power for good works, who yet saw through a glass darkly, who were not tuned to me, but the majority of them were men who felt that in beginning clinical work they had an opportunity of exercising the God-given faculties of sympathy, brotherhood, and love for ther suffering fellow-men.

I have had my calamities. I specially recall to-day two patients with large fatty tumours who died of acute septicæmia; five deaths on the table; one an excision of a malignant thyroid, pulling on the tumour I stretched the external laryngeal nerve and set up spasm in the rima glottidis, and to this day—it occurred, I think, in 1883—I regret that I did not perform tracheotomy. Mr. Annandale had a similar case shortly afterwards, and saved the patient's life by tracheotomy. Two cases of empyema, in which the patients died as I turned them round on the sound side in order to get free access to the rib to be excised. Now I never move a patient from the prone position. One case of a man with acute intestinal obstruction, who was operated on half an hour after admission and was choked by vomited matter passing down into the lungs. I had been assured that he had had nothing to eat, and did not empty his stomach before operating,—I broke Mr. Syme's law, never believe what you are told, "be persuaded in your own mind"; and one, the only death from what appeared to me to be due to an overdose of chloroform, a case of rodent ulcer which I intended to scrape, but death occurred before the operation began. Some people would say heart failure; I always have thought that it was an overdose, for which I take the entire blame. I have often had anxiety from chloroform in hospital and private practice, but this is the only death which I have experienced. I have been wonderfully preserved from fatal accidents during the forty years in which I have been in harness as an operating surgeon. May I be preserved from any form of self-congratulation! All railways and shipping companies know that when a long time has passed without accident, then is the dangerous time. In appendicitis, the chronic variety, I have never yet had a death after the operation. I always wonder how long can it go on? If I might parody a sentence which I found in a stockbroker's circular the other day, "The master hand in surgery is he who on balance can perform successfully a series of operations extending over a considerable period without at any time exposing his patients to undue risk."

In 1882 I was warned by a good friend not to forget the ladder by which I had climbed to the professorship—he had supported my dear friend, that excellent surgeon and good man, John Duncan—and I trust I have never lost my faith in the usefulness of the extra-academical school of surgery. I can say in verity that I have always had a most kindly feeling for all extra-mural teachers. Thirty-seven years ago I joined the band to whom the Edinburgh school owes so much, and this year even my son is one of my opponents treading in his father's steps (1870–1907), a type of the scorpion of Brazil, who, after bringing forth her young, is, as soon as they feel strong enough, swallowed up by a grateful progeny. The only question is, should the old scorpion not retire before the disaster? There are now six surgeons supplementing, ay, strengthening and broadening, the teaching of the principles of surgery given in this room. The system is a good one—especially when we think of Charles Bell, Miller, and Spence, in the Systematic Chair; Syme, Lister, Annandale, in the Clinical Chair; and Heron Watson, Joseph Bell, and John Duncan, —all of them within my own recollection with the exception of Charles Bell, who was before my time.

Excuse the apparent egotism of these recollections, but I feel to-day an extra-mural lecturer again, fighting my battle like my friend Harry Smith of the Wynd. The best preparation for joining the ranks is to read the "Fair Maid of Perth," and be in the spirit on the Inch with the battle-cry ringing in your ears, *Floreat res medica.*

I like to-day very specially to think of the "ancients" among the students, these men who struggle on to obtain their degree. Their efforts are worthy of all praise; they are as a rule likeable fellows. I have learned many things from your Principal, for which I am thankful, and one of the most useful to me has been deference and kindliness to anyone ignorant of his work, to anyone whom it would be dangerous to let loose on the public, to anyone who must still be kept on the chain. Woe to such a man who seemed to be getting on swimmingly in his anatomy oral! he was only asked some very simple questions so that he might leave the room happy. Perhaps I should not have told you this, because the Principal's energy is such that he may at any moment reassert his right, as the senior Regent, to examine all the candidates for a degree.

If you study these "ancients"—commonly called "chronics"—

you will find some of them are regular Uriah Heeps; these it requires some fortitude to like. Then there are the Mark Tapleys, the Micawbers, the Mantilinis, and above all the Dick Swivellers; these one cannot help liking. As a rule, when they escape into the open they make excellent practitioners, because they have much worldly wisdom, gained by associating with many examiners.

There is an aspect of life to which I must refer in a word, the value of clubs. I don't mean golf clubs or curling clubs or political clubs, but social clubs. Edinburgh has always been famous for such gatherings, meeting as a rule in taverns. They still exist. I remember our first club, which met every Thursday for an hour during the winter session in a public-house in Bristo Street. Then what times we had at the Jolly Codlings meetings in Newhaven; the Round Table Club with Joseph Bell, then Robert Blair Cunynghame, as our secretaries. I have the books; some day they will be printed, and then the world will know that the ways of men are very different from what it thought them, and, mark you, all for the better. They will then know And. P. Aitken and love him with his songs, "The Kail Yaird," and better still the "Blue Pill."

"Dae ye ken Blue Peel wi' his coat so grey,
Dae ye ken Blue Peel at the break o' the day."

Cultivate club life without neglecting your wife and children, and you will be all the better for it. Our profession is one in which the bow must be unstrung occasionally. If there was more of the clubbable aspect of life in many a Scottish town, there would be less of the unfortunate bickering between medical men which has made our profession a byword among men. That awful washing of dirty clothes in public is to be avoided as you would poison. I think I have noticed that the best friends are in the towns where whist or bridge flourishes. It is a well-spent shilling given to a friend which makes him forget that a patient of his has gone to you. Patients will change; remember this, you have no vested interests in your patients, and further remember that when you lose a patient he came from somebody else to you. Occasional unbending is a good thing for our school, although I must say I draw the line at some forms of amusements during the working day—card-playing, for instance, before the working day is done.

I think to-day of my fellow-students, from whom I learned much. I would very specially keep them in remembrance—they are many. Of my pupils—what I have learned from them—their name is legion—many have "gone before," and to them my best thanks are surely due. Remember this, there is a current both ways in this room and in the operating theatre and in the wards. I sometimes think the current is greater from you to me than from me to you.

When one begins to think of past days, it is wonderful how the mind goes back to a few men,—Douglas Maclagan, Alexander Peddie, Archie Dickson, David Yandell, Milne Murray, Professor Robertson Smith, John Sibbald, A. Buchanan Stirling, William T. Wood, Alex. Nicolson, Dr. William Robertson, Dr. Willie Brown (my ruling elder), David and James Cornfoot, William Mitchell Banks, Dr. Gloag Wallace, Mr. Trotter, and "Alick" Bell, rise before me. I think if we polled the men of our time that the name of Archie Dickson would be the favourite. Why? because he was a humble man, a simple man, intensely in earnest, and cared not what came of it as long as he did the right. The conscientious man is often a bore; Archie was never that. His brother Alexander was another of the like. He was older, about John Duncan's time.

There is another man who in a ripe old age has recently "gone home"—David Masson. I don't think John Kelman's prayer in the church on Thursday last will soon be forgotten. Why was he liked? Not for his learning, which was great, but for his simplicity and his sincerity.

John Harrison's tribute to him in the *Scotsman* of 9th October exactly described my thoughts of David Masson. Masson's little book on Carlyle has always been one of my favourites.

What does it all come to? the "meek shall inherit the earth"—it is the kindly gentle people that are remembered, while the pushers—rhinoceros hided or serpentine in their ways—with all their wealth, are soon forgotten. As years go on the number of our friends who "go home," as Laotze terms it, becomes more and more numerous, until at last one man is left with no one of his own age to commune with. This year I mourn Dr. Alexander Peddie, who died in February 1907 (Dr. Peddie graduated in 1835. He was, as John Brown called Sir Robert Christison, "Ultimus Romanorum." Of what he was to me, my wife and family, I cannot here speak. A busy, useful life, the genial physician and friend of James Syme and John Brown); James Dunsmure, a dresser with Syme when I was House Surgeon; Alexander Buchan, who gave me my first lessons in botany; and David Milligan, one of the most genial and straightest of my many residents; and Sir William Gairdner. The physicians will speak of him, but I would like to put on record my thankfulness that I was privileged to know him. Here again it was his simplicity of character by which he will be remembered; he ripened with years. His "We will see" to the Glasgow merchant who was very ill and whose case was a puzzle to him, was too suggestive of the ways of a pathologist to be altogether pleasing to his patient.

I have not spoken much of living men, but I must refer to three men—Thomas Lauder Brunton, John Kelman, and John Smith. Of the first, my fellow-student, he graduated in 1866, now a very well known consulting physician, but that is nothing; his strength is his simplicity; any wisdom of the present which he may possess (and we all have some) is only superficial; get at the real man, and Brunton is as he was in our student days, doing good, and his left hand not knowing what his right is doing. Of John Kelman it would be impertinent to speak, but surely I may thank him for what he has done for the Edinburgh students. Many a man far away blesses John Kelman.

The name Smith is a common one, but remember that ever since a Smith wooed the Indian chieftainess, Smiths have been masterful men. Remember Harry Smith. My friend John Smith is not my old football friend and former student (he was Association and I was Rugby), but Dr. John Smith, Surgeon-Dentist to the late Queen, and the author of the best text-book for the student beginning his Clinical Surgery. If he gets the spirit of that book he needs very little else (if he has a grip of anatomical, physiological, and botanical principles) to make him a good surgeon. Dr. Smith has kindly written out the book in his own hand, and it hangs above the mantelpiece in the dressers' room.

Forty-seven years ago I joined this University, and ever since I have been her servant, recognising that the greatest happiness is faithful service. To-day I enter on my twenty-fifth session in this class-room, and therefore hold my silver wedding. Anniversaries encourage reminiscences, and "looking backward" I have tried to picture to you my early struggles—pardon all my egoisms—and if perchance any of you aim at teaching as your lifework, perhaps you may have learned a little that may be a help to you. Remember this, that all of us are teachers in daily contact with our fellow-students—that is what keeps me young, and I include myself in the honourable title of student. We cannot do or say anything without being necessarily teachers in the highest sense of the word.

9427 students have passed through my hands since 1882. What has become of them? Sir James Paget traced his students, and to his deep regret found that two had been hanged. That fact has always deterred me in the study of the life-history of my numerous progeny. I know that two of my ancestors were hanged for sheep stealing in Newcastle; that is enough for me.

I heard the other day in the Dick College an Introductory Lecture by an eminent veterinary surgeon, who told us in simple language that a man's success depends on his moral character. He took as examples Walter Scott, George Frederick Watt, and Charles Darwin. He once lived near Darwin, and he never passed his house without lifting off his hat and bowing reverently to his genius, pertinacity, and humility. His first words fettered his audience: "Lend me your imagination," and he pictured the three stages of the human race. First, its struggle for a bare existence; second, its passage from the uncomplete to the more complete; third, how man became a moral being, and hence arose heroes. He had his heroes, I have mine. In 1860 I joined the University, and in 1860 I got to know three men—John Goodsir, Peter Guthrie Tait, and John Brown. I have often spoken gratefully of the debt I owe them, and you owe them through me. John Goodsir, the philosopher and anatomist; Tait, the precise physicist; and John Brown, the beloved physician. "Lend me your imagination," and believe with me that they are here to-day encouraging us and sympathising with us.

Grasp if you can the nature of your responsibilities. You are all citizens of no mean city, students in a world-renowned University; see, each one of you, that you do nothing that will bring the blush of shame to your Alma Mater.

"Straight is the path of Duty,
Curved is the line of Beauty:
Follow the first, and thou shalt see
The second ever following thee."

THE AFTER-HISTORY OF TWO CASES OF INTER-SCAPULO-THORACIC AMPUTATION FOR SARCOMA.

By Alexis Thomson, F.R.C.S.Ed., *Assistant Surgeon, Edinburgh Royal Infirmary.*

Since the publication in 1887 of Paul Berger's well-known monograph on "Interscapulo-Thoracic Amputation," the operation has been established on a firm basis. The mortality, which previous to 1887 was as high as 29 per cent., has, like that of all major operations as a result of improvements in wound treatment fallen considerably, and in the last series of cases recorded by Jeanbrun and Riche it amounted to 7·8 per cent. The only addition which has been made to the details of the operation is the injection of cocain or one of its derivatives into the brachial nerve cords before dividing them, with the object of minimising shock. Reference is made by most writers on the subject to the rapidity with which the shock of the operation is recovered from, and the rapidity of healing and recovery of strength, the patient as a rule being able to leave his bed within a few days of its performance. This is due in part only to the excellence of the operation, which is so planned that the loss of blood is reduced to a few teaspoonfuls; the rapidity of recovery is also to be associated with ridding the patient of a painful disease and the return of refreshing sleep, and, which is probably still more important, the arrest of the absorption of toxic products from the malignant growth on account of which the operation has been undertaken. It is frequently observed in cases of rapidly growing sarcoma, especially in young people, that the irregular fever, the quickened pulse, the pallor, and other signs of toxæmia, disappear as soon as the growth is removed.

The after-history in many of the cases subjected to interscapulo-thoracic amputation for sarcoma is in sad contrast to the brilliant results which immediately follow the operation. We believe it would be sadder still if it were possible to follow out all the cases. With a view to adding to our knowledge of this aspect of the subject, we record those which have been under our own care:

Case 1.—P. W., æt. 20, a miner, was admitted to Mr. Cathcart's wards in the Royal Infirmary on the 3rd August 1901, sent by Dr. Allison, Loanhead.

Four months before, he was struck in the left shoulder while working in the pit, and a month later he noticed some stiffness in the shoulder with pain on movement, for which he obtained relief by the application of blisters. Two months before admission the stiffness and pain had increased, and an obvious swelling developed in the region of the shoulder, with marked wasting of the muscles.

On admission he was found to be a well-grown lad, with a prominent swelling in the deltoid region, and very marked wasting of the scapular muscles and triceps. The movements of the joint are limited, and there is occasional grating of the articular surfaces. The swelling is firm and hard, except for an area of deep fluctuation about its centre. The head of the bone as felt from the axilla appears normal.

As at this time the X-rays were not available, there was some doubt as to the diagnosis between malignant disease involving the upper end of the bone and tuberculosis.

With the aspirator about an ounce of brownish-yellow serous fluid was withdrawn, and an incision into the swelling was made, and the finger passed into a cavity filled with breaking down tumour tissue, while the surface of the upper end of the shaft of the humerus was studded with spiculæ of new bone, which were easily broken down with the finger. A portion of tumour tissue was removed for the microscope, and proved to be a very cellular sarcoma of a pronounced malignant type.

It was decided to remove the limb and shoulder girdle by the interscapulo-thoracic amputation, and this was done by me on the 8th August 1901, with the assistance of the two house surgeons, Drs. Balfour Paul and Thornley. The only difficulty and loss of blood encountered was in connection with the small or tributary veins passing to the subclavian.

The next day he was restless and thirsty, but on the next again he was very well, and the drainage tube removed. He made an excellent recovery.

On dissection, the tumour was found to have taken origin from the periosteum of the upper end of the bone; it had involved the shoulder joint, which was full of blood, and had spread into the substance of the scapular muscles, especially the infraspinatus and teres minor. The growth was reported by Dr. Shennan, Pathologist to the Infirmary, to be a mixed celled sarcoma.

After remaining perfectly well for the greater part of two years, he began to complain of pain in the left thigh and leg, and a swelling rapidly formed in Scarpa's triangle.

On his admission to the Deaconess Hospital in October 1903, the disease had already made such progress that a radical operation was out of the question. A course of injections of Coley's fluid was followed by relief of the pain, but the disease progressed apparently uninfluenced by the injections, and he died on the 31st May 1904, a little less than three years since the disease had first appeared in the shoulder.

Case 2.—Jessie Porter, ætt 14, admitted to the Deaconess Hospital, 27th February 1907, from Dr. Ferguson of Alloa.

Three months ago she began to feel pain in her left shoulder, and this was attributed to rheumatism. A little over a month ago a swelling was observed, and since then it has increased rapidly, and has affected her general health.

She is pale, thin, with a pulse of from 104 to 120, and a temperature ranging from 98° to 100°. There is a smooth, uniform swelling of the left shoulder, corresponding more or less to the deltoid region, and extending down the upper third of the humerus. It is firm in consistence, and slightly tender below the acromion. There is practically no movement at the shoulder joint, and the muscles of the scapula are greatly wasted. An X-ray photograph showed the changes characteristic of a periosteal sarcoma.

March 3, 1907.—The operation was carried out according to Kocher's description, except that the inner half of the clavicle was avulsed from the epiphysial junction. There was difficulty with a number of cross veins going into the main trunk. The nerves were injected with cocain before being cut across. There was very little shock. The tumour was found to be a chondro-sarcoma springing from the upper end of the humerus.

March 18, 1907.—For the first two or three days after the operation she was as bright and well as possible, and then she began to fall off, the temperature keeping up above a hundred, and a troublesome cough and some dulness developed over the left base, and on the 16th Dr. Graham drew off 16 oz. of blood-stained serum, very suggestive of malignant disease of the pleura.

March 20, 1907.—Some more blood-stained fluid was drawn off from the left chest, and she went home.

Dr. Ferguson wrote that she was so bad on arriving home that he did not aspirate the chest, and she died on the 27th March.

It will be seen from the above that in the first of the cases the disease reappeared before the end of two years in the form of a rapidly growing tumour in Scarpa's triangle; while in the second, before the patient left hospital, there were already signs of the presence of the disease in the pleura, and she succumbed to this within four months of the first appearance of the primary growth.

I find, on looking up my notes of cases in which I have performed amputations for periosteal sarcoma of bone, that the after-histories form very depressing reading, and, as is so well known in relation to cancer, the younger the patient the more unfavourable is the outlook.

The first was a man, æt. 25, in whom the thigh was amputated through its middle third for periosteal sarcoma springing from the inner condyle of the femur; he died a year later of a secondary growth in the skull.

The next was a girl, æt. 12, in whom amputation was performed through the middle third of the thigh for periosteal sarcoma of the tibia. She died nine months later of secondary growths in the lung.

The next was a boy, æt. 19, in whom, after amputation at the hip, I removed the right half of the pelvis for sarcoma commencing in the femur; he died of secondary disease in the lung three months later.

The next was a boy, æt. 11, in whom I performed amputation at the hip for periosteal sarcoma of the femur; he died six weeks later of disease in the lung.

The last, and only encouraging one, is that of a woman, æt. 39, who was the subject of periosteal sarcoma of the upper end of the femur; the bone gave way at the commencement of the operation; I disarticulated at the hip, after ligaturing the common iliac artery by the transperitoneal method two years and a half ago, and she is living and in the best of health at the present day.

Although the histological examination of the growth was undertaken in every case, the number observed is too small to allow of any conclusion being drawn as to the relations between the minute structure of the tumour and its liability to give rise to metastasis.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

The Technique of Vagino-Peritoneal Operations. By E. **Wertheim** and **Th. Micholitsch.** Translated by **Cuthbert Lockyer**, M.D., F.R.C.S. London: Macmillan & Co. Ltd.

As the distinguished authors state in their preface—"in spite of the great progress which has been made in vagino-peritoneal operations during the last ten years, no systematic work has as yet appeared on this subject." We therefore heartily welcome this addition to our gynæcological literature, for the quality of which the names of the writers are in themselves sufficient guarantee.

The volume is lavishly illustrated with 138 full-page illustrations, and these are undoubtedly the feature of the book. They are all actual photographs, which admirably depict the various stages of the operative procedures, and give as nearly as it is possible to do without actually seeing the operations performed, a graphic representation of vagino-peritoneal surgery. The authors have ingeniously overcome the difficulties met with in photographing the operative area (owing to the narrowness and depth of the vagina) by making use of a cadaver, in which, after splitting the symphysis, it was found possible to obtain sufficient vaginal dilatation to render the whole field accessible for photography. They claim that the technique of an operation can be completely understood from a study of the illustrations, even without the aid of the accompanying text, and a perusal of the book certainly bears out this contention.

In one way, the younger gynæcologist may gain an erroneous impression from this work, of there being a greater space to work in than really exists, owing to the aforesaid splitting of the symphysis. On the other hand, a careful study of the plates will enable him to appreciate and understand the various stages of operations which are necessarily difficult to see, as only those who are close to the operator, or even assisting him, can possibly follow every step, and these must consequently be limited in number.

There is no special pleading in favour of vaginal cœliotomy in preference to abdominal section. It is plainly and lucidly stated what can be done by the vaginal route, and its limitations are as clearly given. The authors, in comparing anterior with posterior colpotomy, with respect to the accessibility of the normal pelvic organs, give preference to the former route, with which we cordially agree. In pathological conditions also the preference generally lies with anterior colpotomy. Nevertheless the posterior route has its indications, and in many cases the two operations supplement each other. v. Ott's method of ventroscopy is, we observe, favourably commented on.

In the second part of the volume there is first described and figured a group of operations in which the uterus is not removed, namely—vaginal shortening of round ligaments; vagino-fixation, and intravaginal fixation of uterus; shortening of utero-sacral ligaments; vaginal myomectomy; vaginal operations on Fallopian tubes, and vaginal ovariotomy. The one essential for vaginal ovariotomy is that the cyst be sufficiently mobile: it is not the size so much as the freedom from adhesions which is of importance. Malignancy in an ovarian tumour is a contra-indication to vaginal extirpation, since the necessity of reducing the size of the growth exposes the patient to the risk of infection from implantation of particles of malignant tissue. The anterior incision is recommended in most cases, but in the case of incarcerated tumours in the pouch of Douglas, and possibly in tumours complicating pregnancy, posterior colpotomy may be tried first, and if necessary anterior colpotomy as well. If adhesions exist which would prevent the withdrawal of the tumour, laparotomy must be performed.

Curiously enough, no mention is made of the treatment of chronic inversion of the uterus by the vagino-peritoneal route.

Vaginal hysterectomy is next dealt with, and the methods of doing it from above downwards, and from below upwards, are discussed and compared. Vaginal hysterectomy with dissection of the ureters is specially described, and Schuchardt's incision for allowing freer access to the parametrium and ureters is recommended. The account of Schuchardt's Erweiterungsschnitte is not so clear as one would wish, and anyone who had not seen this useful procedure would find it difficult to understand from this description. Though admitting that many cases of carcinoma cervicis can be dealt with satisfactorily by vaginal hysterectomy, the authors state that regardless of the limitations of the primary focus, metastases may reach so high up, that they cannot be seen, much less reached by the vaginal route. Therefore for the radical removal of a cancer of the cervix, laparotomy is generally to be preferred. In removing the non-malignant uterus along with the annexa by the vaginal route, the method of splitting the uterus is recommended as the best procedure, especially where there are rigid adhesions.

Chapters on "Hæmostasis," on "Drainage," and on the "Treatment of Accidental Injuries" complete the book. On thorough hæmostasis the results in a great measure depend, and the majority of adverse criticisms are based on unfavourable experience with regard to this. The authors prefer ligatures to clamps, but when it is a question of rapid removal of the parts concerned, *e.g.*, in septic cases, there is an advantage in the use of clamps.

Enough has been said to indicate the value of this book to the operating gynæcologist. The vaginal route into the peritoneal cavity is gradually assuming a position of greater importance. Duhressen had a mortality of 2 per cent. in 1600 cases of conservative vaginal cœliotomy, and he has found that 80 per cent. of the gynæcological diseases in which the peritoneal cavity must be opened, can be cured by the vaginal route without causing the patients the anxiety attending an abdominal section, the discomfort of an abdominal scar, or the danger of a ventral hernia. These facts speak for themselves, and furnish a strong reason for the thorough study of vagino-peritoneal operations, which, as the translator states, form admittedly the most difficult branch of operative gynæcology.

The translator and publisher are to be congratulated on the way the work has been brought out in the English language. The translation has been carefully done, and not many errors are to be detected. On page 270 "adnexa" should read "*uterus*," and on page 318 it is difficult to understand what the following sentence means:—"In using gauze for drainage of the peritoneal cavity, the notion was formerly in vogue that early closure of the cavity is delayed by premature fusion of the apposed peritoneal surfaces!"

This book undoubtedly supplies a distinct want, and it should be read and studied by all who have the interests of operative gynæcology at heart.

Metabolism and Practical Medicine. By CARL VON NOORDEN. Vol. I. "The Physiology of Metabolism." By ADOLF MAGNUS-LEVY. Vol. II. "The Pathology of Metabolism." By CARL V. NOORDEN, FR. KRAUS, AD. SCHMIDT, W. WEINTRAUD, M. MATHES, H. STRAUSS. Edited by I. WALKER HALL. London: William Heinemann.

EVERYBODY will accede to the justice of Dr. Walker Hall's prefatory statement, that Noorden's great work needs no specific introduction. Professor Noorden is so well known an authority on metabolism, and has inspired so enthusiastic a following among German scientific workers, that a text-book on metabolism written by him and his pupils at once commands respect, and merits careful study. For a reviewer to do more than glance at a few of the many interesting questions raised in the volume would be futile; and therefore it is right first to try to give some general idea of its nature, for to many readers metabolic studies are repellent from their obscurity. The method of the authors is to state systematically the known facts concerning normal and pathological metabolism, and to discuss critically (and often destructively) current hypotheses. There is very little attempt to build up new theories, and for this the reader will be thankful. Again, only here and there is there much effort to point out the clinical and therapeutic bearing of the researches—many, of course, lead to results the practical importance of which is not apparent at the present time—and the student is left to draw his own conclusions. But any one who will be at the pains to tackle this book seriously may rest assured of a rich harvest. He will find, not once, but many times, new lines of thought suggested to him, fresh facts propounded, and symptoms and their consequences correlated in a manner which will surprise him, and show that no investigation, however meaningless its results may seem to-day, but may be expected as our knowledge of metabolism grows to fall into its place beside the rest, and provide a more scientific basis for the practice of medicine.

The first volume is from the pen of Magnus-Levy. Dealing with the physiology of metabolism, it naturally falls into two parts: Foods and their digestion, and normal metabolism. Chapter iii. contains a particularly lucid and interesting account of the fate of the foodstuffs in the body; the discussion of the relation of acetone to fats and carbohydrates is specially instructive; the present trend of evidence is that all forms of acetonuria are associated with a deficient supply of carbohydrate, and are due to abnormal fat metabolism. The second half of the volume begins with a consideration of the total energy balance, and a discussion of the various methods of estimating the respiratory interchange. At present much of this work seems devoid of clinical bearing. In an appendix to this chapter is a criticism of so-called "luxus consumption." The view expressed is that the sole means of reducing expenditure without diminishing work is by limiting unnecessary movements. On a low diet the body weight falls, and since the greater part of a man's muscular output is spent on moving his body about, there is a corresponding saving of energy. Added to this is the lessened energy required for the digestion of the smaller diet. It is calculated that a saving of 200 calories may be effected by these means, so that the theory of "luxus consumption" is true only to this limited extent. In the sections dealing with nitrogenous metabolism, Chittenden's work receives considerable attention. Levy points out that Voit's standard diet for hard work (which has been of great practical value in improving dietaries) was based on the food actually consumed by labourers, etc., and he offers the following very simple explanation of its high proteid content. The labourer on doing excessive work required to eat more, and therefore took his ordinary diet in larger quantities. He did not, of course, vary the relative proportions of the foodstuffs. Hence a diet of 4000 calories contains 150 grms. proteid as against 115 in a diet of 3000 calories, but this in no way represents an instinctive need of the tissues. Chittenden's results are not questioned; indeed, Levy seems rather inclined to accept the view that the ordinary proteid standard is too high, but he points out that in everyday life it might be difficult to procure a suitable diet with so low a proteid standard. He reminds us, too, that the tissues have enormous power of decomposing proteid beyond their immediate needs, and hints that the results of excessive nitrogenous metabolism are not as deleterious as many think. He also points out that we know very little about the results of decomposition of excessive fat and carbohydrate, and warns us against assuming that they are less harmful than the products of proteid metabolism.

Vol. ii. opens with chapters on Under- and Over-feeding, by Professor Noorden. The problem of "putting on flesh," as distinguished from a mere deposit of fat, is subjected to critical analysis. In health an increase of proteid-sparing foods leads to nitrogen retention and gain in weight, but there is no evidence that the nitrogen retention is permanent. The results, however, are better than those of increasing the proteid element of the food alone—*e.g.*, by adding plasmon, somatose, etc.,—for it seems that as soon as an ordinary diet is returned to, the excess of nitrogen retained is eliminated. After recovery from a wasting illness, however, nitrogen is readily retained until the previous weight is regained. Patients suffering from chronic malnutrition, on the other hand, respond less readily. Noorden does not approve of "over-feeding" cures in which no exercise is allowed; these tend to produce obesity, not to form flesh.

The gist of the matter seems to be, that each individual has a level of his own, and that, unless some special call arises for flesh formation, it is not easy by means of diet alone to establish permanent retention of nitrogen and to "put on flesh."

In the chapter on metabolism in fever, it is somewhat of a surprise to learn that fever does not, *per se*, interfere with the assimilation of food. Schmidt's article on digestive disorders is extremely readable and instructive; his remarks on the relation of gastric disturbances to diarrhœa and constipation are very suggestive in many directions. A cherished belief is exploded in this chapter, where we learn that in obstructive jaundice there is no abnormal putrefaction of the fæces. Apparently it is impossible at present to produce satisfactory evidence of abnormal intestinal decomposition. The criteria in vogue (ethereal sulphates in the urine, etc.) fail under rigorous scrutiny. A large amount of destructive criticism is levelled against the "intestinal auto-intoxication" theories of disease so rife a few years ago. Next come chapters on hepatic, respiratory, and circulatory disorders, but we have not space even to mention the points we had noted for review. The volume concludes with an extremely valuable paper on renal disease by Noorden. The relationship of nitrogenous elimination to diet is discussed at great length, and the bearing of experimental work on the treatment of nephritis stated. Professor Noorden's treatment of Bright's disease differs somewhat from that generally practised. In acute nephritis he restricts the food to sugar and water, rice-water, and little cream, believing that the nitrogen contained even in milk is excessive. In chronic nephritis, on the other hand, his diet is much more liberal; he deprecates treating the kidney at the expense of the nutrition of the patient. He is also an advocate of restricting the fluid taken, and regards attempts to flush out impermeable kidneys as chimerical. He fully recognises the work of French observers in connection with chloride retention in nephritis. Cryoscopy of the urine alone he does not regard as of any great value, but commends it when taken in conjunction with the electrical resistance estimated by Dawson Turner's method (Hæmo-renal index).

We cannot conclude this notice without mention of the valuable classified lists of references to current literature which the volumes contain. The work of translation has been excellently done by a number of collaborators. Considering the size of the book, slips are surprisingly few—in vol. i. p. 299, "3000 calories per kilogramme of body weight" is an erratum, while in vol. ii. p. 477, "sphygmograph" should read "sphygmanometer." Dr. Walker Hall deserves the heartiest congratulations for the way he has exercised his supervisory function, and the appearance of the third and completing volume of the text-book will, we doubt not, confirm our high opinion of his capacity as editor.

Functional Nervous Disorders in Childhood. By Leonard G. Guthrie, M.D., F.R.C.P. London: Henry Frowde, and Hodder & Stoughton (Oxford Medical Publications).

One thing, at least, cannot fail to impress even the casual reader of this volume, and that is that Dr. Guthrie is not only intensely interested in his subject, but has thought over it deeply from all aspects. The book is obviously the outcome of no hasty impulse, but is the fruit of much pondering, reading, and experience. For these reasons Dr. Guthrie has written a good book, and we cannot refrain from adding that his humour makes it a most readable one. Much that we know of the psychic life of neurotic children is gleaned from their adult recollections, hence the theme can be illustrated from a thousand sources, historical, biographical, and literary. Dr. Guthrie has known where to put his hand on these; his instances range from Samuel to Tolstoi, his quotations from "Gulliver's Travels" to the "Bab Ballads." Chapters I. to X. deal with what may be called the commonplaces of the life of the neurotic child—his nervous system, his emotions, his senses, his fears, his disturbed sleep, his failings, his education. We thoroughly agree with the author's point of view, namely, that in the production of functional nervous maladies the diathesis is the one thing needful. That is to say, fright, dentition, indigestion—the hundred and one "causes" of convulsions, night terrors, habit spasm, and so on—really play a very subsidiary part in bringing these about. But, on the other hand, we think that Dr. Guthrie unduly exalts the rôle which predisposition plays, at the expense of that of the environment. One wishes that he had been as insistent on the possibility of building up and conferring stability on an unstable nervous system by appropriate work and surroundings, as he is emphatic on the harm done by improper environment. Naturally, the school-life of nervous children occupies much of Dr. Guthrie's thoughts, and the obtuseness and ignorance of the schoolmaster receives scant mercy at his hands. To gibe at that profession gives as genuine pleasure to the reviewer as it evidently does to Dr. Guthrie, but blame should be justly apportioned, and attention drawn to the cause of the evil — the complacency with which the average parent of the better class entrusts his boys to men whose formal training in education is literally nil, who serve their apprenticeship in their profession at his and his children's expense. *Patet omnibus* is as bad a motto for a profession as it is a good one for a hospital. Passing from this to minor points, we would offer a criticism on the statement that co-ordination of the ocular movements is not established till the third month. This is commonly accepted, but it has always seemed to us that an infant acquires more or less power of binocular vision earlier. Squinting is only occasional after the first month, and for the greater part of the time the ocular movements appear to be co-ordinated to a very considerable extent. Dr. Guthrie rightly attaches great importance to a due amount of sleep; probably, in working-class families especially, where the whole household rises early, insufficient sleep is a common, though unrecognised, cause of bad health among the juvenile members.

The second section of the book begins with a chapter on diseases of the sympathetic nervous system, and then comes one on cyclic albuminuria, pyrexia, and vomiting. It is perhaps stretching the term to speak of these as neurotic maladies, but they have so many features of interest that we are glad to read what Dr. Guthrie has to say about them. In cyclic vomiting, the risk of giving excess of fat, and so causing acetonuria, is mentioned; but there is also the other aspect, the deprival of carbohydrate operating in the same direction. In some cases cyclic vomiting occurs along with a condition of the digestion which is benefited by the limitation of starchy foods, and yet it cannot be denied that this will cause acetonuria. The chapter on dentition is well worthy of study; probably, however, there is at present less likelihood of "teething" being exaggerated as a cause of disease than of its being altogether ignored. The section on the varieties and treatment of chorea is particularly good, especially in its insistence on the value of exercise; we think, however, that arsenic deserves a much higher place in the treatment than Dr. Guthrie concedes to it. The volume concludes with two valuable chapters on speech defects, of which that on idioglossia is particularly instructive. It contains a complete record of a well-marked instance of this curious condition, which ought to be better known than it is at present. The affection is too rare to admit of certainty, but our belief is that most of these cases recover perfectly and spontaneously, apart from systematic instruction. In any case, the important practical point is that, while persistent lalling is highly suggestive of mental defect, idioglossia, which to the superficial observer appears a much more serious matter, is generally associated with at least ordinary capacity.

We must again express our great admiration for the book, which is without any rival in its particular field. It contains much advice and information which one misses in other works, and we feel sure it will appeal to, and be found useful by, a very large circle of readers.

A Text-Book of Embryology. By J. C. Heisler, M.D. Third Edition, revised. Philadelphia and London: W. B. Saunders Co.

Professor Heisler stated in the original preface to this text-book that his object was to provide the medical student with a concise and yet sufficiently full manual dealing with the facts of embryology, seeing that these have acquired in recent years such great interest in connection with the teaching and with the proper comprehension of human anatomy. The fact that the book has already reached a third edition and has been several times reprinted without revision, is the best testimony to the author's success in achieving his object and to the continued usefulness of his work. The present edition has been thoroughly revised so as to make it harmonise as far as possible with the results of recent researches, some sections of the book being almost entirely rewritten. It is illustrated by eight coloured plates, and 186 carefully selected text figures, some of which appear to be new. The tabulated chronology of development at the end seems to us to be especially useful.

Where so much is excellent it is difficult to criticise, but a few minor errors and shortcomings may be pointed out. The author refers to the constructive stage of the menstrual cycle as being of the nature of a preparation for the reception of a fertilised ovum, whereas recent work on the comparative aspects of the subject has clearly shown that this view is no longer tenable. It is scarcely true to say that the question of the origin of the epithelial cells of the Graafian follicle is still an open one, since the researches of various investigators for several years past have consistently shown that these cells, like the ova, are derived from the germinal epithelium. Again, Professor Heisler states that the production of ova and follicles is limited to the fœtal stage, and to the early part of the post-natal period, whereas Miss Lane-Claypon, working in Professor Starling's laboratory in London, showed more than two years ago that under certain conditions ova may develop from ovarian interstitial cells in adult life. In describing the maturation phenomena in the ovum, the author quotes Sobotta's statement that in the mouse only one polar body is extruded instead of two. Kirkham's paper, correcting this observation, and showing that the mouse is not exceptional in this respect, as Sobotta supposed, was perhaps published too recently for Professor Heisler to avail himself of it. The ruptured Graafian follicle does not necessarily become converted into a corpus hæmorrhagicum, as the reader is led to believe.

Lastly, we think that the author might have adopted a more uniform system in quoting authorities and in citing references to the literature.

Pathology, General and Special, for Students of Medicine. By R. Tanner Hewlett, M.D. Second Edition. London: J. & A. Churchill.

The fact that this book has reached a second edition within a year shows how acceptable it is to those for whom it was written. It is not surprising that it should be so, for it contains a clear, concise, and up-to-date account of all the subjects coming within the range of General and Special Pathology, though it numbers under 600 pages. The ground covered is enormous, and it is impossible not to admire the skill of the author in selecting and arranging his material so as to avoid the omission of a subject of any importance and still keep within the limits of space he has imposed upon himself.

The additions made to the present edition are well chosen. They include references to the work of Leathes, of Wilcock and Hopkins, of Woods Hutchinson and Van Noorden in animal metabolism and gout; a more extensive account of the theories of the causation of cancer, of immunity (the aggressins and the method of estimating the opsonic index receiving notice), of syphilis, of heart block, of arterio-sclerosis; and the chapter on the female generative organs, from the pen of Dr. Frank E. Taylor, has had a good deal of new material added to it, relating to endometritis, erosions of the cervix, fibroids, chorion-epithelioma, and the toxæmia of pregnancy.

The student commencing the study of pathology will find this book a great help, though he may require to supplement the information given upon some of the more important system diseases. The senior student and the practitioner will obtain both profit and pleasure from its perusal.

Voice Production in Singing and Speaking, based on Scientific Principles. By Wesley Mills, M.D. London: J. Curwen & Sons.

This book is intended for those who are learning to sing or to speak in public, and is written in a semi-popular style; it appears, however, to be too technical for the lay reader. After the introductory chapters there is a short, but not very clear, account of the elementary physiology of nervous and muscular tissue, and of reflex action. The hints to young singers in regard to breathing, diet, clothing, exercise, avoidance of fatigue, etc., are good, though not new. A chapter on the physics of sound follows that on the anatomy of the larynx, which is difficult to follow, but the section on breathing is distinctly superior to either. Chapter xvii. gives a short and useful account of the organ of hearing. The author is strongly opposed to modern unscientific voice-training, and favours the old Italian school of teaching. The views expressed as to the action of the epiglottis and of the crico-thyroid muscle are not those usually accepted. The writer is a firm believer in "the register," and follows the teaching of Madame Marchesi. Undue modesty is not a feature of the book, and on p. 25 the author says, "I do not think I know all that is to be known"; he objects to "cramming," and certainly writes very diffusely, so that the summaries which are to be found at the end of most of the chapters are much needed; there is a great deal of repetition in the book. A certain facility is, however, displayed in the use of similes, though the best and clearest parts of the work are the quotations from other authors. As an example of the style of writing, the following passage may be quoted:—Of the evil effects of alcohol the author says, "How many bright lights in the dramatic and musical professions have been prematurely quenched through indulgence in the delusive draught?" The illustrations are numerous, but unequal in quality.

Practical Anæsthetics. By H. Edmund G. Boyle. London: Henry Frowde and Hodder & Stoughton.

This little work forms no exception to an excellent series of handbooks. The production is very good, and the matter to the point and eminently practical. There is a complete absence of complicated methods and apparatus, but, at the same time, all subjects of importance are dealt with, allusion even being made to so recent a development as "acid intoxication after chloroform." With the author's views on the respective merits of ethyl alcohol chloroform and that prepared from methyl alcohol and acetone, we are unable to agree; we have several years' favourable experience of the latter and the best chemical opinion to support our faith. The statement that more animals die under methyl chloroform than under ethyl chloroform is somewhat diverting! We hardly think the use of ethyl alcohol chloroform can be common in laboratories.

The author's views on the value of ethyl chloride and "gas and ethyl chloride" are ultra-conservative. A recent paper in this Journal goes far to demonstrate the value of these two agents in brief dental and other operations.

NOTES ON BOOKS.

DR. WELLS records in *The Influence of Cod Liver Oil on Tuberculosis* (The University Press, Manchester), the results of a series of experiments with tuberculous and non-tuberculous pigs on the comparative value of cod-liver oil and cod-liver oil emulsion. The work was done under the supervision of Professor Delépine, and goes to show that while cod-liver oil improves the nutrition both of normal and tuberculous animals, it acts most efficaciously in the form of an emulsion. Changes indicative of cure were observed in the organs of tuberculous animal sunder the influence of the drug. A proprietary emulsion was employed, but we do not suppose that it is intended to suggest other than that any well-prepared emulsion would give analogous results.

Mr. Godlee's introductory address on the *Past, Present, and Future of the School for Advanced Medical Studies of University College, London* (John Bale, Sons, & Danielsson, London) is a sketch of the rise of University College, which has deservedly been rescued from the oblivion of fugitive writings by publication in this form. It is fully illustrated, and will be valued not only by old University-College men, but all who are interested in the question of university education in London.

Judging from the papers in the *Transactions of the American Climatological Association* (vol. xxii. 1906, Philadelphia), the society does not limit itself to purely climatological work. Among the topics discussed in this volume are the administrative control of cerebro-spinal fever, the diagnosis of tubercle, heart block, and cardiac dilatation. There are also several clinical records, and a number of interesting papers on climate, baths, light, sanatoria, and fresh air in the treatment of disease. It is the record of a useful session's work.

We have on many previous occasions spoken in appreciative terms of *International Clinics*, and the first volumes (series xvii., vols. i. and ii., J. B. Lippincott Co., London), under the new editorship of Dr. Longcope, maintain the high reputation this quarterly has gained. Catering as the work does for all tastes, a great variety of subjects in all departments of medicine is dealt with in these volumes. The leading feature of volume i. is the "Epitome of Progress for 1906," Dr. Steven being responsible for "Treatment," Drs. Edsall and Nisbet for "Medicine," and Dr. Bloodgood for "Surgery." Dr. Warthin contributes a valuable paper on "Enlarged Thymus." Contrary to the general view, he regards this as the essential dangerous feature of lymphalism. There is an excellent paper on "The Functional Capacity of the Heart" by Dr. Norris, and a number of other valuable articles. Volume ii. is particularly strong all round. Dr. Dock pleads the claims of "Laparotomy *versus* Paracentesis in Ascites"; Dr. Letulle has an exhaustive paper on "The Ova of Intestinal Parasites in the Fæces," and there is a well-timed article on the "Cerebro-spinal Fluid" by Dr. Rous. One of the chief communications is by Dr. Lee, and deals with "Post-partum Hæmorrhage." The subject is thoroughly thrashed out in a practical way. Dr. Rotch discusses "Gonorrhœa and Syphilis in Infancy," and there is an up-to-date paper by Dr. Pisek on "Infant Feeding." Under the head of "Pathology" come three papers of outstanding merit—"Experimental Cerebro-spinal Meningitis," by Flexner; "Gonococcal Infections," by Tyree; and "The Bone Marrow," by Carnegie Dickson. The volumes as a whole fully maintain their representative international character.

Among retrospects of medicine the *Practical Medicine Series* (The Year Book Publishers, Chicago), which appears annually in ten volumes, and has the advantage that each volume may be obtained separately, takes a high place. Vol. i., edited by Drs. Billings and Salisbury, gives a résumé of the year's progress in "General Medicine," exclusive of nervous diseases and constitutional disorders. A great deal of judgment has been shown in abstracting papers, and the result is satisfactory in being both practical and well up to date. As examples of topics which have been exciting interest during the past year or so, and which receive brief but sufficient notice in this volume, may be mentioned "Heart Block," "Enterogenous Cyanosis," "The Orthodiagraph," "Pentosuria." The series seems to us admirably adapted for the practitioner, for whose use it is intended.

The thesis of Dr. Rabagliati's pamphlet, *The Functions of Food in the Body* (Elliot Stock, London), is that its sole use is to restore waste, not to produce either heat or energy. So far as we understand it, his argument implies a modified form of vitalism, the theory being that, during sleep, man derives his capacity for work and his heat from the all-pervading energy of the universe. If we have interpreted him inaccurately we apologise to Dr. Rabagliati, and in extenuation plead that we may have failed to grasp the exact meaning of such phrases as "anthropino-biodynamic" (which has "a pretty constant temperature of 98°·4 F."), "kentso-neuro-bio-dynamic," "synoidal-bio-dynamic," and the like. It would, of course, be quite out of place in these columns to criticise Dr. Rabagliati's position. Here is no question of whether Voit, Chillenden, and the rest are wrong, and Dr. Rabagliati right. The crux of the matter is the old conundrum which has vexed metaphysics since metaphysics was—mind and matter, subject and object, materialism *versus* idealism. With due deference, we decline to follow Dr. Rabagliati into the contest. He is wrong in saying that modern science is wholly materialistic; until the philosophers have settled their differences she is (again *pace* the author) a contented agnostic concerning matters outside her ken.

A fifth edition of Dr. Tuebey's work on *Treatment by Hypnotism and Suggestion* (Baillière, Tindall, & Cox, London) has been issued. When this work appeared first in 1889, it was almost the sole representative in English of publications dealing with this subject. Now there are several other books available, but Dr. Tuebey's volume still retains its place as a comprehensive and useful statement of knowledge in this branch of study. It has been revised and enlarged for this new edition; among the additions may be mentioned an introductory chapter by Sir Francis Cruise.

The World's Anatomists, by G. W. H. Kemper, M.D. (P. Blakiston's Son & Co.), contains concise biographies of anatomic masters from 300 B.C. to the present time, with eleven illustrations. It is a little volume, which should prove useful for reference for those interested in anatomy.

The twenty-third annual issue of the *Official Year-Book of the Scientific and Learned Societies of Great Britain and Ireland* (C. Griffin & Co. Ltd., London) maintains its reputation for complete and accurate information, and we heartily recommend it as a most useful book of reference.

The Police Surgeon's Emergency Guide, by C. Graham Grant (H. K. Lewis, London), is a small book which the author suggests may "justify its existence by saving its owner from making the little slip that leads to trouble." This pretension, we are convinced from a perusal of the volume, will not be fulfilled. It contains many inaccuracies, and little, if any, information which is not, we feel sure, possessed by every police surgeon.

We heartily recommend this excellent book, *The Office of Midwife*, by Stanley B. Atkinson (London: Baillière), to everyône interested in the subject of midwifery, be they medical practitioners, those who have to do with the training or the supervision of midwives, and finally to midwives themselves. The author gives a most lucid account of the provisions of the Act of 1902, and of the rules which have been framed to regulate the proceedings of the Central Midwives' Board, as well as those which have been drawn up with reference to the practice of midwives and their various duties and obligations. We confess, however, that the part which has interested us most is the chapter dealing with the evolution of the midwife, and, as the author remarks, the story is not without deep human interest. This chapter, along with a short literary appendix, places before the reader a historical synopsis which every student of medicine should be acquainted with.

This handy little volume—*The Ophthalmoscope*, by Gustavus Hartridge (Churchill, London)—has become so popular with students that a fifth edition has been called for in the short space of sixteen years. The arrangement of the book is simple and systematic, and the subject is presented in a clear and lucid manner. Excellent illustratious are interspersed throughout the text, which will enable the student to master the subject without much difficulty. It is an excellent manual for students.

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UNDER THE CHARGE OF

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ACUTE LEUKÆMIA; CHLOROMA.

LEUKÆMIA.—To judge from the number of papers which are written about leukæmia, it might be supposed that the last word had been spoken on the subject, yet so far is this from being the case, that many of them show that our conception of the disease must be considerably widened; this is particularly the case in reference to its acute form. Emerson (*Johns Hopkins Hosp. Bull.*, Baltimore, 1907, March) discusses three acute cases at length, and his paper has the practical interest of going in detail into the clinical features of the disease, and showing how protean a form it may assume.

CASE 1. *Acute lymphatic leukæmia without splenic or glandular enlargement, with localised involvement of the marrow, and many white cells soluble in dilute acetic acid.*—The illness ran a course of eight weeks, marked by anæmia, prostration, and terminal "air hunger." There were no characteristic symptoms except the blood count, which showed a leucocytosis of 880,000 with 96 per cent. of large lymphocytes. Even at the post-mortem no glands were found enlarged. One of the most interesting points connected with the case was the limitation of the marrow lesion. The only bones which were affected were the vertebræ. This illustrates Grawitz's conclusion, that it is necessary to examine many bones before pronouncing the marrow healthy. One may associate the escape of the sternum and long bones with the absence of tenderness during life. Emerson divides cases of acute leukæmia into several groups, and though there is no essential pathological difference between them, a classification based on symptoms is useful, otherwise the nature of these cases is liable to be overlooked. We have—(1) Acute "typical" cases, which differ from the ordinary chronic type only in their duration; (2) the acute infectious type (illustrated by Case 2), simulating typhoid or septicæmia; (3) the hæmorrhagic form, suggestive of purpura; (4) the acute cachectic group (illustrated by Case 1), in which weakness and loss of flesh are the chief symptoms. In all varieties a "bucco-pharyngeal" onset is common, lesions of the mouth and throat being present in the early stage of most cases. This series of symptoms, again, is divisible into two main groups—pseudo-scorbutic, including tenderness of the gums, stomatitis, and gangrenous ulceration of the mouth; or pharyngeal, beginning as an acute tonsillitis, with exudate which sometimes resembles diphtheria very closely. Cases beginning with very acute mouth and throat symptoms are very liable to be overlooked at first. As a subvariety of the purpuric group there is a series of cases in which cutaneous lesion is the dominating clinical picture, the skin being studded with papules of lymphoid tissue, sometimes simulating a papular syphilide. Some cases, again, begin with acute nephritis, and some with acute gastro-intestinal symptoms. Pulmonary complications, especially pleurisy, are common. As regards nomenclature, Emerson wishes to see the time-honoured designations myelogenous and lymphocytic dropped for good, and would rather speak of myelocytic and myeloblastic. He adopts the modern view that one of two cells may predominate,—a large non-granular or a large granular cell. The former (so-called large lymphocyte, non-granular marrow cell, lymphoid cell, etc.) is named myeloblast, on the assumption that it is the primitive marrow cell; the latter is the myelocyte. Every transition between these two occurs, and the distinction is to a large extent arbitrary, and depends partly on technique and personal opinion. "It may be that they [*i.e.* myeloblasts] are only an early generation of cell which later changes to one of the various granular cells, or perhaps to a red cell. It may be that in myelocytic cases the descendants of these same cells which have changed to granular cells are increased; perhaps the disease attacks a different generation of bone marrow cell. . . . It is possible that the relative proportion of these cells is an index of the profundity of the marrow involvement, the myeloblasts preponderating when the marrow lesion strikes at the root of the cell genesis, the myelocytes when the involvement is less fundamental." Emerson also points out, as a fact often lost sight of, that many of the cells go to pieces in dilute acetic acid. By comparing counts made with Toison's fluid and dilute acetic acid, he found that 203,000 cells were disintegrated in the acid mixture.

CASE 2 was *acute (myelogenic?) leukæmia, resembling septicæmia, with leucocytes almost all lachromatophilic.*—The illness began acutely, and lasted twenty-four days. At first the symptoms resembled typhoid, but the fact of a negative Widal put this out of court, and then septicæmia was suspected. The leucocytes were only 12,000 at first, and the spleen was not enlarged. The leucocyte count rose steadily at the rate of 10,000 to 20,000 per day, and at the time of death was 180,000. Throughout the illness there was continued fever, ranging between 100° to 105°. This case well illustrates the deceptive nature of the symptoms of acute leukæmia. Typhoid fever having been excluded, the sweating, pyrexia, and leucocytosis suggested septicæmia; then the possibility of miliary tuberculosis and malignant endocarditis were considered. At a later stage there were cramps in the upper part of the abdomen, which led to the fear that perforation had occurred, and a day or two later the rapidly enlarging, tender liver, along with the constitutional symptoms, closely simulated hepatic abscess. In fact, permission for an exploratory laparotomy had been obtained, when a differential blood count revealed the true condition, the leucocytes by this time having risen to 60,000. There was a notable absence of anæmia, the red corpuscles being fully 4½ millions, which is higher than in most cases of acute leukæmia. This high red count may throw light on the nature of the two forms of acute leukæmia. Granting both to be myelogenous, one supposes that in the lymphoid form the myeloblasts predominate, in the other the myelocytes (the same cell further differentiated, with granular protoplasm). Hence in the latter, cells of a later generation are involved. It is supposed that these same indifferent cells (myeloblasts) are directly related to, if not the same as, the parent cells of red corpuscles. It is clear, therefore, if this be true, that in the acute lymphoid type the formation of red cells would be more affected, and so the red count lower, than if the white series was affected at a point below the branching off of the red series. A further point which greatly obscured the diagnosis was the difficulty in getting satisfactorily stained specimens of the blood. The cells could never be got to take on the stain distinctly, whatever technic was employed. Most of the cells were represented merely by a blur, but a few eosinophile and neutrophile mononuclears could be detected; this, along with the fact that no lymphocytes were shown with methylene-blue stain, favours the opinion that the cells were mostly granular. Non-staining is generally said to be due either to immaturity or degeneration of the cells, but in this case Emerson ascribes it to some property of the blood (or plasma) as a whole, for the red cells stained as badly as the whites. The appearance of the marrow post-mortem was, however, compatible with a diagnosis of myeloblastic leukæmia, as the undifferentiated cells preponderated.

Case 3.—*Acute leukæmia (?) with leucopenia, "Aplastic leukæmia."*—The duration of the illness was three weeks, and on admission to hospital the patient appeared absolutely exsanguine. There was marked enlargement of the superficial glands, spleen, and liver. The red cells were about a million, the white 3800,—showing 43 per cent. large lymphocytes, 39 per cent. small lymphocytes, 14 per cent. polynuclear, 1 per cent. eosinophiles, 2 per cent. mast cells, 2·5 per cent. indefinite. The patient had not the lemon tint of pernicious anæmia. Subcutaneous hæmorrhages developed before death, and the red corpuscles sank to 724,000 and 1920 respectively. No autopsy. The diagnosis of the case is by no means evident. Emerson rules out acute pseudo-leukæmia by the blood picture. Aplastic anæmia seems excluded by the glandular and splenic enlargement, and the only possibility left appears to be aleukæmic leukæmia, though Emerson admits that the blood was practically identical with that of aplastic anæmia.

Hirschfeld (*Berl. klin. Wchnschr.*, 1907, June 24) reports two fresh cases of acute myelocytic leukæmia, a disease the existence of which was doubted up till a few years ago, Hirschfeld having been one of the first to record an indisputable case. The first of his new cases occurred in a boy of 6, the duration of the illness being just six weeks. There was both splenic and glandular enlargement. The red cells were diminished; there was a leucocytosis of 40,000, with 12 to 23 per cent.

of myelocytes and an increase of large lymphocytes. There was no excess of eosinophiles, and no nucleated reds were present. The splenic pulp, glands, and liver showed myeloid transformation. The pathological changes, and the appearance of the blood, assure the diagnosis. The absence of eosinophilia and mast cells is characteristic of acute myelocytic leukæmia, as opposed to the chronic form. The second case was in a woman æt. 66, whose illness lasted a month. There was a splenic tumour, and leucocytosis from 72,000 to 141,000, with 11 to 16 per cent. myelocytes. The spleen became smaller as the disease progressed. On first examination eosinophiles and mast cells were present, but they subsequently disappeared, and on examination of the organs were only found in diminished number. Clinically, the chief symptom was intractable diarrhœa; there was no fever. This case differs from any hitherto recorded, in that during the early stage the blood was the same as in the chronic form. In Hirschfeld's opinion it is possible to trace a continuous series of cases beginning with acute lymphocytic leukæmia and ending with acute myelocytic leukæmia, numerous transitional forms occurring intermediate between the two extremes. Acute leukæmia is, according to this view, a specific malady. The theory rests on the results of modern research on the origin of the leucocytes, according to which all arise from a common myeloblastic ancestor. Under normal circumstances these cells in the spleen and glands produce lymphocytes, in the marrow granular myelocytes. We meet with cases of acute lymphocytic leukæmia in which the cells are indistinguishable from myeloblasts, and in which there is no sign of glandular or splenic enlargement. These are myelogenous lymphocyte leukæmias. On the other hand, cases occur in which some of the cells have this character, others that of myelocytes, and further, cases in which all the cells resemble myelocytes, except that they have few granulations. In acute lymphocyte leukæmia there is the least differentiation, or, as Hirschfeld puts it, the greatest possible "undifferentiation," while the less the "undifferentiation" has proceeded the more do granular cells preponderate.

Simon (*Am. Journ. Med. Sc.*, Phila., 1907, March) records a remarkable case of *leukæmic blood picture in a patient suffering from fracture of the ankle.* The literature of blood findings in fracture is very meagre; in certain cases, however, it seems that the leucocyte count is raised, and that myelæmia up to 3 to 7 per cent. may occur. In Simon's case the changes met with were much more striking than this. The patient was admitted with a compound fracture of the ankle. Differential counts made on the 13th and 20th days after the accident showed only polynuclear leucocytosis. Cellulitis developed, and the leg was amputated a month after the accident. On the day before the operation the white cells were found to be as high as 50,000, and stained specimens had the appearance of leukæmia, there being 5·5 per cent. lymphocytes, 56·2 per cent. polynuclear, 6·2 per cent. eosinophiles, 17·5 per cent. mast cells, and 16·2 per cent. myelocytes. Many normo- and megaloblasts were also found. A week later the blood changes were much less pronounced, and on discharge the appearance was normal, as also on examination six months later. Simon at first thought that the accident had occurred to a leukæmic patient in an aleukæmic interval; the rapid return to normal, especially the disappearance of mast cells, however, decided him against this. He supposes that the extensive destruction of the red marrow, plus the infection, led to temporary hyperactivity of the hæmopoietic function. The case is believed to be unique.

Chloroma.—Two fresh cases of chloroma have been reported during the past year. In Lehman's patient (*St. Petersb. Med. Wchnschr.*, 1906, September 7), a youth æt. 19, the disease ran the unusually acute course of only four weeks. It resembled leukæmia clinically—hæmorrhages, splenic tumour, blindness, tenderness of the bones. The blood showed leukæmia. The true nature of the disease was only recognised post-mortem by the discovery of greenish tumour of the kidney, intestine, marrow of the femur, and orbital cavities. The tumours consisted of large cells with rounded nuclei; there were also a few eosinophiles, and small cells with granular nuclei. Pfeiffer's case (*München. med. Wchnschr.*, 1906, September 25) also was undiagnosed during life. The patient was æt. 4, and the illness was chronic. The blood was normal, except for anæmia. There was deafness, with perforation of the left tympanum. The tumours involved the zygomatic fossæ and orbits, causing proptosis, and a provisional diagnosis of ethmoidal disease with cavernous sinus thrombosis, led to an exploratory trephining, which was followed by hernia cerebri. Post-mortem, green chloromatous tumours were found on the dura, in the temporal bone and orbits, in the vertebral column, and throughout the glands. The microscopic appearance of the tumours was that of lymphosarcoma. None of the cells with highly refractile granules, to which the green colour has been ascribed, were found. This case falls into Group 1 of Sternberg's classification into lymphocytic and myeloid chloromata,—it was a chloro-lymphosarcoma, not a chloro-myelosarcoma. An interesting feature is the absence of blood changes, which must greatly have hampered diagnosis; it should be stated, however, that no examination seems to have been made during the later stage of the disease.

SURGERY.

UNDER THE CHARGE OF

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The Normal Anatomy of Tendon Sheaths and Teno-Vaginitis Crepitans.

In the majority of cases of typical teno-vaginitis crepitans, Küttner (*Centralbl. f. Chir.*, Leipzig, 1907, August 3, Supplement) has remarked that the characteristic friction noise is not found where the anatomical descriptions declare the tendon sheaths to lie, but that it is higher up, more proximal, both to hear and to feel. This obtains in the upper extremity, in which the region of the wrist is usually free, while the crepitation is observed over the prominence of the extensor muscles of the thumb, often as far as the middle of the forearm. Still more markedly is this the case in the lower extremity. In six carefully observed cases the tendon sheaths around the ankle were quite free, while there was crepitation and pain in a distinctly swollen, slightly reddened, and sharply defined zone, which was situated on an average 11 cms. above the level of the malleoli, and reached upwards for 7 to 10 cms. in the form of a horizontal band about the breadth of the hand. Excluding the prominence of the shin, the crepitation was felt in this ring-like segment or zone over the muscles, while the œdematous swelling was continued over the inner aspect of the tibia. This observation, repeatedly made, leaves two inferences open. Either many cases of so-called crepitating synovitis have nothing to do with the tendon sheaths, and in favour of this view is the fact that similar changes are met with over the tendo Achillis which has no sheath; or, the tendon sheaths extend further upwards than is generally accepted; according to the existing descriptions, the sheath of the tibialis anticus, which extends highest of all, only reaches 5¾ cms. above the level of the malleoli, that is to say, considerably below the zone described in the disease. In order to clear up this matter, the author directed Drs. Weiss and Seemann to investigate the tendon sheaths of the lower extremity. They have shown that our knowledge of the normal anatomy of these structures is in many directions defective.

The observations made on thirty-three lower extremities, and some on the upper extremity, were done by injecting water and air, as these are able to penetrate without force and produce fewer artificial effects than the ordinary wax and gelatine injections. The most important result elicited was that the tendon sheaths are not closed above in all cases, and that the condition varies in the different extensor muscles of the leg. The sheath was closed above in the tibialis anticus in 55 per cent. of the cases; in the extensor hallucis in 70 per cent., in the extensor digitorum only in 18 per cent.; in all other cases the tendon sheath did not show any decided closure above, and the injection spread upwards along the tendons and muscles for a considerable distance, in some cases above the middle of the leg.

The next point is, where is the weakness in the upper closure of the tendon sheath, or, in other words, where is the communication with the parts above? Into the upper end of the tendon sheath there projects a process, which was described by Rosthorn as *the plica semilunaris*, dividing the upper end of the sheath into two pockets, an anterior and a posterior. The anterior pocket is almost always firmly closed above, and that which appears in operations and superficial dissections as the upper end of the sheath. In the present connection the posterior pocket is the more important; it contains, below the actual plica semilunaris, one to three very similar but more delicately formed folds, which in the movements of the limb separate from one another and then dovetail into one another. The communication of the tendon sheath with the connective tissue covering the adjacent tendon and muscle lies, when present, in the area of the posterior pocket. In some of the cases the plicæ in the posterior pocket are firmly fused with the tendon. In that case the tendon sheath has not only an apparent but also an actual closure above. In other cases the connection is very loose, forming an open network through which the injected air or fluid easily infiltrates upwards in a series of wide spaces, which must be reckoned as belonging to the fascia propria.

A few of the experiments showed the following phenomenon. While the injection was made from below, the anterior pocket became filled. If one waited a little and injected afresh without using any force, the injection went further upwards, while the anterior pocket remained filled as before. In the short pause between the two injections the fluid in the anterior pocket which had at first pressed the plica semilunaris firmly against the tendon then got under the plica, raised it up, and thus opened the way upwards for the second injection. It would appear, therefore, that even when there is a communication with the adjacent cellular tissue, there is a kind of valve mechanism which under normal conditions hinders the access from below upwards, while it permits of movement in the opposite direction—conditions which, for the physiological circulation of fluid in the tendon sheath and for the origin of pathological exudation, appear to be of importance.

How are these anatomical conditions related to the described forms of teno-vaginitis crepitans? We may assume that the inflammatory process begins over the damaged muscles and tendons, extends downwards, but in the territory of the tendon sheath does not come to light because the arrangements for gliding movements are better or the tight ligaments and layers of fascia obscure the picture. Against this view is the fact that the crepitating zone always appears horizontally, extending over all three muscles and lower over the bone, and it would be very extraordinary if an inflammatory process resulting from overstrain affected three muscles to the same degree and at the same level, the muscles differing from each other anatomically and physiologically, while their tendons and tendon sheaths end at different levels. It would therefore appear that the clinical features of many cases of so-called teno-vaginitis crepitans have nothing to do with the tendon sheaths.

But where is the inflammatory process localised? These anatomical investigations give the answer. Beneath the fascia of the leg and between it and the fascia propria belonging to each individual tendon or muscle, there lies in the lower half of the leg a layer of very loose connective tissue, almost a kind of space which at this level extends on to the inner aspect of the tibia, and is almost horizontally closed below by the transverse crural ligament. This layer is the seat of the disease; indeed, the process can freely extend more or less in the form of a ring, the fibrinous exudate being superficial to the muscles and tendons and also over the tibia. Overstrain is more likely to affect this layer of tissue than the tendon sheaths themselves, as it is not so well adapted to bear friction and pressure.

The moral therefore is, that there are many cases in which the name "teno-vaginitis" is not applicable, as there are numerous cases in which the inflammatory process does not affect the tendon sheaths, but the layer of tissue between the fascia propria and the damaged muscles and tendons, and the general fascia of the extremity. This affection appears to lead to what is known as *peri-myositis crepitans* (Brauer), and might be called *meta-desmitis crepitans.*

TOTAL EXTIRPATION OF THE BLADDER, WITH BILATERAL LUMBAR URETEROSTOMY.

ACCORDING to Rovsing (*Centralbl. f. Chir.*, Leipzig, 1907, August 3, Supplement), the mortality of the operation of extirpation of the bladder, which has been over 50 per cent., is not so much due to the extirpation itself as to the difficulty of arranging for the cut ureters. The present methods are: leaving the ureters at the bottom of the wound; or inserting them into the rectum (Maydl), or into the sigmoid flexure, or into the vagina and closing it below. Rovsing's method is to bring the ureters out in the loin. The bladder should be dissected out like a cystic tumour, without being opened, in the following way. The bladder is filled with 200 cms. of phenosalyl solution, and the patient placed with the pelvis elevated. The incision is convex downwards, and the recti are partially divided so as to give free access to the bladder. The vertex and lateral portions are shelled out from the loose connective tissue, the connective tissue bundles enclosing the blood vessels being divided between two ligatures. The posterior wall is dissected out from the peritoneum, but if the latter is adherent to the infiltrated bladder it is widely opened and the whole peritoneal covering removed along with the bladder. The ureters are tied with a double ligature 1 to 2 cms. above their terminations, and cut across. In the female it is easy to separate by blunt dissection the neck of the bladder and 1 to 2 cms. of the urethra; the latter is then clamped with an angiotribe and divided behind this. In the male it is much more difficult, as the prostate and floor of the bladder must be separated very carefully. The membranous urethra is then accessible, and is cut across behind a clamp, which is left on for twenty-four hours to prevent bleeding from the spongy tissue. If the peritoneum has been opened and that covering the bladder removed, it must be closed with a glover's stitch. The whole cavity is then packed by Mikulicz' method, the gauze being soaked in 1 to 2 per cent. solution of nitrate of silver. The end of the packing is brought out in the middle line, the recti stitched together, and the wound closed. This stage of the operation lasts for from half to three-quarters of an hour. At the same sitting a lumbar incision is made on either side from the outer border of the erector spinæ for 8 to 10 cms. The ureter is sought for with the forefinger near the pelvis, and brought out at the wound, while the forefinger separates the rest of it down to its ligatured end. Both ureters are now hanging out free in a symmetrical position in Petit's triangle. The rest of the lumbar incision is stitched.

The ureter should not be stitched at all, but should hang out into a sterile vessel, a rubber catheter being passed through that portion of it which passes through the abdominal wall. Where it projects from the skin, it is drawn through a perforated rubber finger cot for protection. The free portion contracts and dies down to 2 to 3 cms., and, when the lumbar wound is healed in eight to fourteen days, the necrotic portion is cut away, and the living remains as a small, beak-like opening projecting from the skin, and is soon covered with epidermis.

The catheter is now removed and the urine which escapes is collected by a special apparatus connected with a urinal below the symphysis. One of Rovsing's patients has worn this for eleven months day and night, and has been kept absolutely dry. The author gives details of three cases, one of which, a man, æt. 67, died eight days after the operation of uræmia, both kidneys being found atrophied.

The advantages of this method are—(1) That it makes it possible to have a complete aseptic wound; (2) that ascending infection from the rectum, sigmoid, or vagina is avoided; (3) in the female, it has the advantage over implantation into the vagina, as the latter is kept intact for genital functions.

It is possible that this operation should not only be useful in diffuse malignant tumours, but also in all cases of extroversion, and in ascending urogenital tuberculosis.

The reader is referred to a paper by F. S. Watson of Boston (*Ann. Surg.*, Phila., 1907, September), in which the author, who some years ago recommended bilateral ureterostomy in this and in other conditions, describes a simple and ingenious apparatus for collecting the urine.

THE TECHNIQUE OF RESECTION OF THE LIVER.

IN considering this subject, Anschütz of Breslau expresses his disapproval of complicated methods. By making a clean cut in the liver substance, the bleeding vessels, he says, are easily seized with forceps and tied, while, if the liver is crushed, the vessels are torn and retracted. In stitching together portions of liver, the sutures should be drawn slowly but very tightly. In the majority of cases plugging may be dispensed with and the abdominal wound closed. To give better access, the costal margin can be resected or broken, and the suspensory ligament divided.

TRAUMATIC PARALYSIS OF THE SERRATUS MAGNUS.

SAMTER of Königsberg demonstrated the case of a girl, æt. 14, on whom he had operated for this condition seven and a half months before. With a view to operation in such cases, it is most important to determine beforehand where the nerve is injured. It has been shown that the nerve may be caught between the first rib and the coracoid process when the shoulder blade has been displaced inwards and forwards, as had happened in the case he showed. The majority of cases belong to this group. He detached the sterno-costal portion of the pectoralis major from the upper arm and fixed it to the lower angle of the scapula, two holes having been made through the bone for the sutures; and the arm was kept elevated for twelve days. The paralysis, which had lasted for eleven months, was cured in twelve days. It can be shown that the serratus is still paralysed. The transplanted muscle is excitable to electricity, and contracts under the influence of the will.

This operation is indicated in traumatic paralyses which do not recover spontaneously; in neuropathic paralysis, excepting progressive muscular atrophy; in congenital defects of the serratus, if the pectoralis major is present; and in cases of congenital upward displacement of the scapula which resemble clinically paralysis of the serratus magnus.

OBSTETRICS AND GYNÆCOLOGY.

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STERILITY FROM ATRESIA OF THE FALLOPIAN TUBES.

Dolèris (*Compt. rend. Soc. d'obstet. de gyn. et de pédiat. de Paris*, 1907, June) reports the case of an otherwise healthy woman, æt. 28, who was absolutely sterile. Menstruation, established at 14, was normal. The uterus was retroverted, measured 2¾ in., and the appendages appeared to be enlarged. An operation was performed to correct the position of the uterus. At the same time the left tube and right appendages were removed on account of malformations. The inner half of the right tube was found wanting, while the middle third of the left tube was reduced to a thin impervious cord. Another case is also reported of a girl, æt. 17, who, previous to coming under observation, had been quite regular. She then had an attack of pelvic peritonitis, traceable to a swelling in the right fornix. On operating it was found that this swelling was due to a pyosalphinx and cystic ovary. The left cornu uteri was absent, and the uterus with the right tube was not well developed. The first case is of special interest on account of the regular menstruation, although there was such extreme atresia of the tubes.

PHTHISIS AND THE INDUCTION OF ABORTION.

Amstel (*Beitr. z. Klinik d. Tuberk.*, Bd. vii. Heft 2) does not think that phthisis (except in the later stages) causes abortion. He gives the history of seventeen cases, to show the results to mother and child by allowing the pregnancy go to term. In every case the phthisis made rapid progress during pregnancy; one woman died during labour, the others at intervals after labour varying from three days to eighteen months. Of the children, one died at birth, only four reached the age of 1 year, and three that of 3 years. He quotes Maragliono's statistics in forty-two cases, which showed that 94 per cent. of phthisical pregnant women die within a period of twenty-one months after labour, as compared with a death-rate of 18 per cent. in non-pregnant women in the same period. With such results Maragliono advises the induction of abortion in every case of phthisis complicated with pregnancy. When, however, the disease is in a curable stage, Amstel would induce abortion so as to increase the chances of the mother's recovery, but in advanced cases he would allow the pregnancy go on in the interests of the child. He formulates certain conclusions thus—(1) Pregnancy, labour, and the puerperium have a harmful effect on an already existing phthisis. (2) Where a hereditary predisposition exists, pregnancy often causes the development of phthisis. (3) Children of tuberculous mothers are weak, have little resistant power, and are predisposed to phthisis. (4) The dangers which marriage may bring should be pointed out to tuberculous women. (5) The indication for the induction of abortion is more pressing the less far the phthisis is advanced. (6) Only in cases where there is no hope of the mother recovering should the pregnancy be allowed to go to term.

SCOPOLAMINE-MORPHINE NARCOSIS IN LABOUR.

C. J. GAUSS (*München. med. Wchnschr.*, 1907, July 31) reports 500 cases of labour under scopolamine-morphia narcosis; 233 of these were primiparæ. At the beginning of labour a solution containing $\frac{1}{75}$ to $\frac{1}{100}$ gr. of scopolamine and $\frac{1}{6}$ gr. morphia was injected subcutaneously; if this had not the desired effect the injection was repeated containing half the quantity of the above drugs. The saporific action could be maintained for several days without apparent injury. The largest total amount used on one patient was $\frac{1}{30}$ gr. scopolamine and nearly $\frac{5}{6}$ gr. of morphia during a period of forty-eight hours. Contra-indications are primary weakness of labour pains, debility, febrile affections, anæmia, and conditions of somnolence. The method is harmless to both mother and child.

ECLAMPSIA TREATED BY DECAPSULATION OF THE KIDNEYS.

GAUSS (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 22) states that in 75 per cent. of all eclamptic cases delivery terminates the convulsions; in the remaining 25 per cent. life is sacrificed if no relief is obtained. He reports two cases in which great aid was rendered by decapsulation of the kidneys. In both convulsions were severe and continued after delivery. Decapsulation was done after convulsions had continued for several hours after delivery. After the operation only two convulsions occurred in one case. The unconsciousness was diminished, the pulse and temperature fell, the amount of urine increased, and the specific gravity became normal. Albumin and casts, previously present in large amount, decreased, and recovery ensued. In many cases of eclampsia early delivery is all that is necessary, but if fits continue in spite of forced labour, then the author believes that decapsulation should follow, so as to give the patient a chance of recovering from the uræmia which would soon prove fatal.

ECLAMPSIA TREATED BY LUMBAR PUNCTURE.

AUDEBERT and Fournier (*Ann. de gyn. et d'obst.*, Paris, 1907, June) describe several cerebral lesions as being frequently met with in eclampsia, such, *e.g.*, as œdema, congestion, meningeal hyperæmia, and hæmorrhages. In many cases the cranial sinuses are much dilated. Cerebro-spinal hypertension exists before and during the convulsive stage. If the convulsions are due to such hypertension, lumbar puncture should relieve the symptoms. The author has treated two cases in this way, and has collected forty-two other cases. One of the author's cases recovered after having had six seizures before puncture. After puncture she had three much less severe fits, and coma became less deep. The second case died of complications, although the brain symptoms were much benefited by the puncture. The authors believe that although this is not to be regarded as a choice method of treatment, yet it should be combined with other methods of treatment when coma is profound and the fits very severe.

DELIVERY IN ECLAMPSIA BY BOSSI'S DILATOR.

R. **SCHOCKAERT** (*Bull. Soc. belge de gyn. et d'obst.*, Bruxelles, 1907, vol. xviii.) believes rapid evacuation of the uterus to be the rational remedy for eclampsia. When the cervix is dilatable, delivery by forceps or version is best, but when the cervix is closed and labour has not begun, other methods become necessary. In multiparæ, manual dilatation may serve to open the cervix. In primiparæ this is impossible, and some method of instrumental dilatation becomes necessary in severe cases with repeated convulsions. The author does not favour Cæsarean section or cervical incisions as recommended by Dühissen. He regards Bossi's dilator as an eminently satisfactory instrument, being both rapid and safe. The author reports three successful cases where the fits were very frequent and severe. The only precaution necessary in using this instrument is to dilate slowly and ascertain with the hand how the dilatation is progressing.

PLACENTA PRÆVIA IN SCHAUTA'S KLINIK.

BURGER and Graf (*Monatsch. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xxv. Heft 1) state that in the years 1892–1905, among 44,676 labours there were 342 cases of placenta prævia (1 : 130), 63 central, 123 partial, and 156 lateral. They occurred most frequently in multiparæ between 31 and 35 years, and after previous labours had been complicated. Most of the cases were treated by Braxton Hick's method of version without immediate extraction. The results for the mother were relatively good, only twenty deaths, or 5·85 per cent. Of the children, only 45·1 per cent. were born alive.

THERAPEUTICS.

UNDER THE CHARGE OF

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INTRAPERITONEAL INJECTION OF OXYGEN IN TUBERCULOUS ASCITIS.

KURT SCHULZE has treated a series of seven cases of tuberculous peritonitis by this method with satisfactory results, so that after an interval of one and a half to two years all the patients were able to work. The procedure followed consisted in puncturing the abdomen and allowing as much fluid to come away as could be obtained, but no special effort was made to remove all the fluid. Immediately after the fluid ceased to run, oxygen was introduced. The quantity introduced varied from 500 to 1500 c.c. As a rule, enough gas was introduced to produce a corresponding distention to that which prevailed before the fluid was removed. In about one half of the cases the introduction of the gas produced no discomfort. In the remaining cases the patients complained of moderate abdominal pain, but this passed off in eight or nine days. A couple of patients had some vomiting in the first few days, and in two other patients slight irritation of the bowel was shown by moderate diarrhœa. Immediately following the infusion there was marked meteorismus, but as a rule this had subsided after the eighth to tenth day, and from this point definite absorption of the exudation was demonstrable. In only one case did the fluid collect again, so that a second infusion of oxyen was required. In six of the seven cases the infusion produced no rise of temperature, but the seventh case showed a moderate febrile reaction lasting four days. The average period of treatment lasted nine weeks. As regards the *modus operandi* of the oxygen infusion, Schulze points out that the gas certainly exerts an irritant action upon the peritoneum, but whether this depends upon a hyperæmia of the peritoneum or upon a chemical alteration in the exudate or on the bacilli, is not yet known. In conclusion, he mentions that in two cases of ascitis due to hepatic cirrhosis the infusion of oxygen was quite without action.—*Mitt. a. d. Grenzge. med. u. Chir.*, Jena, 1901, vol. xviii. Heft 1.

SULPHATE OF SODIUM IN PHENOL POISONING.

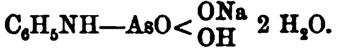
SOLLMANN and Brown have reinvestigated the effect of treating carbolic-acid poisoning by sulphate, and came to the conclusion that such treatment is of no value. However administered, sodium sulphate is not a chemical antidote to phenol. This is clearly brought out from the following statements:—(1) Chemical combination between phenol and sulphate does not occur outside of the body either in neutral weakly acid or weakly alkaline solutions. (2) The convulsive and blood-pressure effect produced by phenol are not modified in the slightest degree by intravenous injection of liberal quantities of sodium sulphate when the phenol is given by the mouth, or intravenously. The previous administration of sulphate intravenously has also no action. Any temporary benefit from intravenous injections of sodium sulphate is due to the salt action, and can be obtained also by injecting normal saline.—*Journ. Am. Med. Assoc.*, 1907, March 23.

DIGESTIVE FERMENTS.

SOLLMANN points out some obvious fallacies about digestive ferments as ordinarily prepared. Ferments are delicate bodies, and are easily affected by their surroundings. Thus mixture of ferments act upon one another, leading to destruction of the weaker ferment. If the mixture is acid, the trypsin and diastase will disappear; if it is alkaline, pepsin and diastase will disappear; while if the mixture be neutral, pepsin will destroy diastase, and trypsin will destroy pepsin. Many digestive ferments are put up as alcoholic solutions despite the fact that alcohol slowly destroys the ferment, so that unless the preparation is used within a few days of its preparation it is quite worthless as a digestive agent. Aqueous solutions also deteriorate rapidly. The only liquid medium that is really suitable is glycerin. Further, in dried form ferments keep indefinitely, but as soon as they are dissolved the above observations hold good. After the digestive agent is taken into the body, its efficacy depends upon the reaction of the surrounding medium. It is possible that the contents of the stomach remain alkaline for some two hours after food is taken, as up to the end of this period the gastric churning movements are not marked and the gastric contents remain unmixed. If a ferment of diastase or trypsin is to be effective in this condition, it must previously have been intimately mixed with the food, as ferments diffuse very gradually. Another point to be considered is whether ferment can survive gastric digestion. Peptic digestion destroys diastase in test-tube experiments.—*Journ. Am. Med. Assoc.*, 1907.

CORRECT FORMULA OF ATOXYL.

ACCORDING to recent observations carried out by Fourneau, atoxyl is not the anilide of meta-arsenic acid, as was at first supposed. The correct description appears to be monosodic salt of the anilide of ortho-arsenic acid. It contains 29·10 per cent. of arsenic and not 37·69 per cent., as was originally stated. The formula suggested is



$$C_6H_5NH—AsO<{}^{ONa}_{OH}\ 2\ H_2O.$$

This formula has been criticised by Ehrlich and Bertheim, who state that the arsenic is not fixed to the amidogen group NH_2, but to the benzene nucleus. Consequently they deny that atoxyl is the sodium salt of an anilide of the formula $C_6H_5NHAsO_3NaH + 2\ H_2O$. According to them, it is the sodium salt of a true arsenical derivation having the formula of

$$C_6H_4<{}^{NH_2}_{AsO_3}\ NaH + 4\ H_2O.$$

In any case, atoxyl remains identical with the substance discovered by Béchamp in 1863 on heating the arseniate of aniline. The content in arsenic is the same, and the different findings with regard to water of crystallisation probably depend simply on the fact that the French and German authorities have tested samples dried at different temperatures. The product obtained by crystallisation in water contains five molecules of water of crystallisation, and solutions of the dried commercial preparations of atoxyl always give a similar finding.—*Bull. gén. d. thérap., etc.*, Paris, 1907, July 8.

BILE.

BARBIER and Cruet recognise a syndrome in dyspeptic infants which points to insufficient functioning of the liver. The infants present signs of intoxication, with pallor, loss of weight, and deficient appetite. They are constipated, and the stools are of bad colour, very fœtid, voluminous, and of pasty consistence. With these symptoms is frequently associated an enlargement of the liver. They ascribe these symptoms to a deficiency on the part of the biliary secretion, and propose as a remedy the administration of bile. It is given in doses of 1½ grain of the dried bile. This is a white powder of slightly bitter taste. The dose is divided into two portions, one of which is given morning and evening dissolved in a bottle of milk. The effect of such treatment is as follows. First of all, in a few (four to eight) days the stool takes on a healthy colour. The fœtid odour disappears. The pasty consistence takes longest to pass off, as it depends on non-utilisation of the fats. The bile has an excellent effect in regulating the action of the bowels. The general effect upon the health is soon manifested. The infants cease to lose weight, and the general state of health improves. Treatment needs to be continued for a considerable period.—*Bull. gén. de thérap.*, Paris, 1907, July 8.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Diphtheria Bacilli in Normal Throats.

Anna von Sholley (*Journ. Infect. Dis.*, Chicago, 1907, June, vol. iv. No. 3) contributes an interesting paper on the presence of true diphtheria bacilli in apparently normal throats. Her object was to determine approximately in what number of individuals among whom diphtheria is most frequent, namely, children in crowded tenements and institutions, virulent diphtheria bacilli are found. The investigations were carried out in the research laboratory of the New York City Health Department, and covered, firstly, a series of 1000 children (so far as known, not recently exposed to diphtheria) living in the crowded tenements of New York, a city in which there are some 8000 to 12,000 cases of diphtheria reported each year; and, secondly, a series of 202 cases from the immediate family of patients suffering from diphtheria, *i.e.* contact cases. Her results are as follows—(1) Diphtheria-like organisms are present in a certain number of apparently normal throats, even where exposure to infection by diphtheria cannot be traced. (2) A certain proportion of these cases (one-third in the writer's cases) are virulent, and the persons thus infected are a potential source of danger to the community. (3) The other conditions being the same, virulent diphtheria bacilli are found in the mucous membranes of those exposed about four times as often as in those not similarly exposed. (4) Mild sore throats and "colds" with bloody nasal discharge, such as are fairly common in children, should always be tested by swabbing and cultures in the usual manner, and should not be lightly disregarded. The finding of virulent diphtheria bacilli in the throats of apparently non-contacts is not to be taken to mean that infection may arise other than from a previously infected case. The sources of infection in crowded quarters, *e.g.* dwelling-houses, schools, shops, hotels, restaurants, public conveyances, and the like, are so numerous that infection is probable, although it may be impossible in many cases to trace it.

THE RESULTS OF THE USE OF REFINED DIPHTHERIA ANTITOXIN (GIBSON'S "GLOBULIN PREPARATION") IN THE TREATMENT OF DIPHTHERIA.

DRS. PARK and THRONE (*Am. Journ. Med. Sc.*, Phila., 1906, November) give the results of treating 100 cases of diphtheria by a partially refined antitoxin, *i.e.*, one from which a considerable proportion of the non-antitoxic globulins as well as the albumins have been removed. This new preparation, when tested by animal experiments, appears to retain all the antitoxic properties, and to have lost much of the deleterious matter of the whole serum, so that while its curative value is as great, severe rashes, joint complications, fever, and other constitutional disturbances are less likely to occur. It is not yet determined whether it is less likely to cause collapse in the rare cases of peculiar susceptibility, such as in a certain percentage of those suffering from status lymphaticus, but it is worthy of note that it has now been used in several thousand cases of diphtheria without accident. The concentration of the antitoxin, made possible by the elimination of the non-antitoxic substances, is likely to be carried to further perfection in the near future. It is not only a convenience, but a distinct clinical advantage, since it tends to encourage large doses. It will be remembered that marked constitutional disturbances are especially likely to follow large doses, 10,000 to 20,000 units of the whole serum, doses which may be necessary in young children who have high temperatures due to broncho-pneumonia or other complications. Similar doses of the new preparation are much safer.

THE ELECTRICAL CHARGE OF TOXIN AND ANTITOXIN.

FIELD and TEAQUE (*Journ. Exper. Med.*, N.Y., 1907, May) show that—(1) Both diphtheria and tetanus toxin and their antitoxins are electro-positive, that is, they pass to the cathode under the influence of an electric current. (2) The character of the charge is not altered by a change in the reaction of the solvent. (3) If the combination of toxin with antitoxin is a true chemical one, they should travel in different directions, *i.e.*, the one to the anode and the other to the cathode under the influence of an electric current. Since this does not occur it is thought that their union is not a true chemical reaction, but a matter of absorption, as was first suggested by Bordet. In an earlier paper in the March number of the same journal they showed that the specific agglutinins are also electro-positive, that the proteid matter of the serum is not amphoteric, but travels towards the cathode whether its reaction be acid, neutral, or alkaline, and that the bacteria agglutinin combination can be dissociated by means of the electric current.

FAT EMBOLISM.

GRAHAM (*Journ. Med. Research*, Boston, 1907, July) has performed a number of experiments upon rabbits in order to elucidate the findings carefully described by him in a case of fat embolism in a man, æt. 18. His conclusions are grouped as follows—(1) Two lesion complexes may be found in fatal cases of fat embolism. The first consists of an extreme blocking of the pulmonary vessels, together with a less marked involvement of those of the heart, and with almost only a negligible blocking of the vessels of the general body. The second involves widespread embolism of the blood channels; the pulmonary lesion being of secondary importance, and being overshadowed by lesions of the heart, kidney, and central nervous system. (2) Death occurs in the first class of cases from asphyxia, and follows closely upon the trauma or disease leading to the entrance of fat into the vessels. In the second class of cases it depends upon multiple cerebral emboli, associated with embolism and fatty degeneration of the heart. In such cases death follows only after the lapse of some days (usually three to eight). (3) The dividing line between fatal and non-fatal amounts of fat is ill defined. Individual susceptibility appears to be widely variant. (4) An amount of fat which would be fatal if suddenly gaining entrance into the blood stream produces no unfavourable symptoms if it enters the circulation in divided doses separated by intervals of several days. Such fat is gradually eliminated through the kidneys and by the phagocytic action of the leucocytes. (5) Fatty degeneration of the heart in fatal cases is often accompanied by similar changes in the diaphragm; the skeletal muscles remaining unaffected. Such diaphragmatic lesion may in part account for the respiratory disturbance always observed. Two good plates and a useful general biography of fat embolism are given.

THE RÔLE OF THE SPLEEN IN TRYPANOSOMIASIS.

LAVERAN and **THIROUX** (*Ann. de l'Inst. Pasteur*, Paris, 1907, August) discuss the protective power thought by some to be possessed by the spleen in trypanosomiasis. That the spleen does possess some protective power, exhibited chiefly by a phagocytic action in many diseases, is generally believed. Many, indeed, think that this is the case in malaria, but Laveran holds a contrary opinion, which he expresses in his "Traité du paludisme," second edition, Paris, 1907, p. 396. He attributes the apparent alleged increase of phagocytosis which the malarial spleen generally shows to the pigmented elements present in the blood of malaria, and to their tendency to accumulate in the spleen. He and Thiroux performed a number of experiments on animals infected with trypanosoma, with the object of determining whether the spleen acted in the same way in this disease. The communication of MM. Rodet et Vallet to the Academy of Sciences in July 1907 was not made until after this paper by Laveran and Thiroux was printed, but they nevertheless believe that they have shown that the new arguments brought forward by Rodet et Vallet in favour of the destructive power of the spleen in trypanosomiasis are not convincing. Their conclusions may be thus summed up—(1) In their experiments they found that the trypanosomata taken from the spleen during life or immediately after death differed in no material way from the same trypanosomata taken from the circulating blood at the same time. (2) That an extract of the spleen *in vitro* showed no trypanolytic properties. (3) That the evolution of trypanosomiasis was in no way sensibly modified by splenectomy. (4) That the spleen probably acts in trypanosomiasis in the same way as in malaria, by showing a greater activity only towards the products of the organism, which accounts for the great enlargements of the spleen seen in many animals. The enlargement of the lymphatic glands so common in human trypanosomiasis is in relation to the multiplication of the parasites within the glands, from which they can so easily be obtained by puncture.

CONTRIBUTIONS TO OUR KNOWLEDGE OF GONOCOCCUS.

VANNOD (*Centralbl. f. Bacteriol. u. Parasitenk.*, Jena, 1907, May 23 and June 20) passes in review the best media which have been proposed for the growth of the gonococcus, and prefers ordinary agar with sufficient 10 per cent. carbonate of soda added to give a very feeble blue colour to litmus paper. As a liquid medium he recommends veal broth, not peptonised, reduced to a quarter of its volume by evaporation, and mixed with ascitic fluid in the proportion of 1 : 3. It grows very fast in this, being plentiful at the end of twelve hours. If the culture is left at 19° C. for two hours, or at 12° C. for half an hour, all growth stops. For the immunisation of animals he employed gonococcal nucleo-proteid, which could be given in precise doses. When mixed with carbonate of soda it formed a milk-white liquid. A dose of 0·09, sometimes less, injected into the veins of a rabbit, produced paralysis of the limbs, convulsions, enormous dilatation of the pupils, and death generally in a few minutes. The author thinks that the serum of rabbits immunised with this nucleo-proteid will excite a curative action; that, given even quarter of an hour after a fatal dose, an animal may thus be saved. This serum agglutinates in dilutions of 1 : 200 to 1 : 400. While it contains immune body against the gonococcus, it does not do so against the meningococcus.

INSANITY

UNDER THE CHARGE OF

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AN EXPERIMENT IN CIVIC MEDICINE.

THE plea of insanity is so often brought forward in trials for various offences that any effort, especially when that effort has so far proved successful, towards impartially presenting before the judge and jury the medical evidence on the point, deserves careful consideration. Dr.

Schwab has placed on record (*Journ. Nerv. and Ment. Dis.*, N.Y., 1907, February) the details of such an effort, which has been tried in St. Louis recently. A Commission of four, consisting of the prison medical officer and three specialists in nervous and mental disease, has been appointed, with the concurrence of the State Judge, and State Attorney who acts as prosecutor in criminal cases. Their duties are to examine all prisoners whose mental soundness is in any way suspected, and present a report embodying the results of their examination and their opinion of the prisoner's mental state and his responsibility for the crime with which he is charged. The object is to obtain a wholly unbiassed presentation of the medical evidence on these important points, and so prevent, as far as may be, the unedifying spectacle of medical experts on each side giving testimony of an absolutely contradictory nature. According to Dr. Schwab, the St. Louis scheme has been a great success, though as yet it has no legal standing. The members are also unpaid, and there is no desire at present that they should be either recognised by the legislature or paid for their services. It is feared, in the latter case, that the appointments would become bound up with politics, and that this would endanger the success of the Commission's work. In this country no such objections can be urged, though it would probably be better that at first no remuneration should be given for such work. If it proved satisfactory, it would soon obtain the remuneration it deserved. Specimens of reports actually presented are given in Dr. Schwab's paper. He lays it down as most desirable that these reports should be as untechnical as possible, and should be directed to making quite clear the person's mental state and especially his responsibility, rather than to giving a diagnostic label. It is stated that in no single instance has the Commission's report been rejected, even when other medical evidence was brought against it. Such a result does very much to rehabilitate the value of disinterested medical evidence in legal eyes, which at present rather look askance at it.

The Bacteriology of General Paralysis.

A contribution to this much debated subject is furnished in a short paper by Dr. F. W. Langdon of the Cincinnati Sanitarium (*Am. Journ. Insan.*, N.Y., 1906, October). He examined seventeen persons, ten of whom were well-marked general paralytics. His conclusions are that the *B. paralyticans* has been found in the blood, cerebro-spinal fluid, urine, and urethral mucus of paretics, and that it is absent from the urine, pharyngeal, and tonsillar mucus of healthy individuals, and of those affected with other psychoses. Examining his facts more closely, it is found that the bacillus was detected and cultured in three cases, but it is stated that complete examinations were not made; in some only the pharynx and tonsil, in others only the urine, were tested. In one it was obtained from the cerebro-spinal fluid post-mortem, and in another from the urethral mucus. In the third case the diagnosis of paresis was doubtful, and in it the organism was found in the urine. In other words, the bacillus was undoubtedly present in two out of ten cases of general paralysis, and in one of two doubtful cases. It was absent in one doubtful case, in eight out of ten paretics, in one case of organic dementia, in one of dementia præcox, and in three healthy individuals. The evidence is therefore by no means very strong in associating the organism with the disease. It is stated that more complete investigation of future cases is to be made, as the bacillus may be present in some situations but not in others. From the notes of the cases given in the paper it is seen that other micro-organisms were found in some of them. It is also to be noted that, in the case in which the bacillus was found in the cerebro-spinal fluid, no organisms were obtained in cultures of the blood and pharyngeal mucus ante-mortem.

It cannot be said that the results above stated do much to strengthen the view that the *B. paralyticans* is the cause of general paralysis, but such work is to be welcomed as assisting in the ultimate solution of the problem. Greater care and thoroughness in examination and the devising of improved methods may do much to settle the matter one way or other.

THE CEREBRO-SPINAL FLUID IN GENERAL PARALYSIS.

AN interesting investigation of this subject has recently been contributed by Dr. W. B. Cornell (*Am. Journ. Insan.*, N.Y., 1907, July). A series of twenty-five cases was operated upon, and the cerebro-spinal fluid investigated as regards pressure, cytology, and albumin content. He concludes that every case of paresis exhibits a spinal leucocytosis and increase of albumin. The former is also from its constancy in all probability the earliest definite symptom. From this it follows that the diagnostic value of a negative finding is in most cases greater than a positive one. He advocates the use of an accurate and reliable cell-counting method, such as with Fuchs' and Rosenthal's slide, without centrifuging, as giving strictly comparable results. The use of Unna's polychrome-blue as a staining diluent is of advantage, as it enables a differential count of the various forms of leucocyte to be made. This differentiation permits of a distinction being drawn between a leucocytosis of a paretic origin and one which is not, as in the former case the increase is almost invariably in the lymphocytes. His final conclusion is that there seems to be a correlation, both qualitative and quantitative, between the spinal and hæmic leucocytosis, which particularly refers to the mononuclear cells, though it includes the polymorpho-nuclear, especially after convulsions.

A STATISTICAL STUDY OF THE CLINICAL FORMS OF GENERAL PARALYSIS.

DRS. P. SERIEUX and M. DUCOSTÉ give an account of the analysis of the various clinical forms of general paralysis in 150 cases admitted to the Ville Evrard Asylum (*Progrès méd.*, Paris, 1907, March 10). These forms are eight in number, the demented, the maniacal, the expansive, the depressed, the persecutory, the circular, the hypochondriacal, and the sensory. In the figures given the majority belong to the first, third, and last, the percentages being 24, 27, and 24 respectively. The remaining 25 per cent. are distributed fairly evenly amongst the other forms. The variety of the classification goes towards supporting Bruce's contention that general paralysis is a disease of the brain which may be accompanied by mental symptoms. There are, however, difficulties in the way of accepting this view which need not now be stated.

THE NEURO-FIBRILS IN VARIOUS PSYCHOSES.

THE results of a very careful investigation of the state of the neurofibrils in cases of general paralysis, senile dementia, chronic alcoholism, cerebral syphilis, and microcephalic idiocy are recorded by Dr. Fuller (*Am. Journ. Insan.*, N.Y., 1907, April). The method used was that of Bielschowsky, and the parts examined were from fifteen identical positions in both hemispheres of each brain, the tissue being obtained as soon after death as possible, in some cases three hours or even less. Short histories of the cases are given, and then the pathological findings, naked-eye and microscopic.

In the summary with which he closes, the author's opinions are thus stated. The alterations in the neuro-fibrils when taken alone do not appear to have any greater value for diagnostic purposes than the mere disintegration of the granules which is shown by Nissl's process. In general paralysis, the poverty in cell processes, the more or less universal tinging of the nucleus, and the destruction of finer intercellular fibrils, are the characteristic features. In senile dementia, the diffuse destruction of intercellular fibrils, but without special preference of the finest elements, with fair preservation of the dendrites, is the rule. In the remaining group of cases the changes observed may be due to a variety of causes, such as œdema, faulty nutrition, or toxic agency. Granular disintegration, fragmentation, localised swellings, rarefaction, and complete destruction of the neuro-fibrils are found in varying degrees of intensity in all the cases.

It will thus be seen that no very startling results are claimed, but there are, notwithstanding, many interesting facts recorded which confirm or disprove previous statements based on other methods. Detailed descriptions are given of the appearances found in the sections from various parts of the brain, which were selected according to the views of their function adopted by Campbell in his already classical work. For these reference must be made to the paper itself. The value of the paper is greatly enhanced by a considerable number of excellent plates.

THE GENESIS OF GENIUS.

DR. ROBINOVITCH gives the results of investigations of heredity in this most interesting question (*Journ. Ment. Path.*, N.Y., 1906, vol. vii. p. 247). Seventy-four men of outstanding ability as poets, writers, statesmen, scientists, etc., were taken more or less at random, and their hereditary history examined. As a result, it was found that ten of them were first-born, while sixty-four were not first-born. From this the conclusion is drawn that genius is more likely to appear in the younger members of a family, and that its appearance is dependent upon the parents having attained full maturity. A method such as this is open to many fallacies. The average number of children in these families and the number of girls first-born would require to be known before the above conclusion could have any real significance. In addition similar statistics with regard to a large number of persons of ordinary ability would require to be available before a comparison with those of extraordinary ability could be made. If the authoress of this paper would direct her investigations in this direction it is probable her conclusions would be modified.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF
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Cough of Nasal Origin.

Lermoyez draws attention to attacks of coughing, the cause of which is to be found in the nasal cavities (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, 1907, September). He commences by criticising a diagnosis that is sometimes made—that a cough, the cause of which is not detected, is purely nervous in origin. He proceeds to describe the case of a lady, who suffered for ten years from severe attacks of coughing, which became worse as time went on, and which was treated in a variety of ways by different medical men. In the absence of signs of bronchial or pulmonary mischief, it was at first regarded as a throat cough. Local treatment was therefore resorted to, with a negative result. Five years later, when the cough was even more troublesome than formerly, she was examined by a physician at a spa, who, in the absence of lung symptoms, explained the cough as of a rheumatic nature. Accordingly, the constitutional condition was treated, but no benefit ensued. Later, another diagnosis was made, and, as previous treatment had proved ineffectual, the cough was now regarded as nervous in origin. In spite of remedies directed to overcome this, the condition became worse. The paroxysms were very violent, coming on during the night and interfering with sleep. After having suffered for nine years, the patient for the first time had her nose examined; she had never suffered from any nasal symptoms, but she asserted that when she had a cold in the head, the cough was not so severe, and sometimes she was even free from it. Examination of the nose revealed the presence of some small mucous polypi attached to the left middle turbinated body. Posterior to these there was a crest on the septum; otherwise there was nothing abnormal in the throat and nose. At that time the patient refused operation, but a year later she consented, as the cough had become aggravated. The polypi were removed, and with their removal the cough disappeared. More than a year after the operation, she still remained free from her attacks.

While the cough produced by stimulation of the vagus nerve is physiological, that produced in the distribution of the fifth cranial nerve is always, or almost always, pathological. The nasal cough has certain characteristics, which should lead us to suspect its nature. It is a dry cough, though the patient may expectorate some small plugs of dirty mucus from the pharynx. It is convulsive, acquiring an increasing intensity up to the end of the cough. As in whooping-cough, there may be nausea and even vomiting and cyanosis. It is also progressive: there is no spontaneous disappearance, and time does not wear it out. It cannot be controlled, or held back by a voluntary effort. The redness of the throat or the congested appearance of the interarytenoid region, which might be regarded as the explanation of the cough, should not deceive the observer, as it may be the effect and not the causal element in the case. Even the examination of the nasal fossæ is not always conclusive. There may be an evident gross lesion as in the case just recorded; on the other hand, the mucous membrane may appear normal. Upon the latter, however, there may be areas, contact with which may induce severe coughing. They vary in their situation, but they appear to have a preference for the anterior end of the inferior turbinated body. These areas may be demonstrated by the use of the probe. If they are then cocainised, and again touched with the probe, the cough is no longer induced.

Chronic Middle-Ear Suppuration.

Milligan has recently drawn attention to the necessity of having a clear conception as to what is meant by chronic suppuration of the middle ear (*Journ. Laryngol.*, London, 1907, October). He further points out how valuable may be the information derived from a microscopical examination of the pus, not only in estimating the chronicity of the case, but also as an aid in drawing conclusions as to the pathological changes which have taken place in the middle-ear cavities. Hitherto chronicity has been estimated clinically mainly by a time limit. Other points, which have been taken into consideration, have been the absence of acute pain, the more or less continued abeyance in the function of the organ, the existence of a discharge, the presence of a perforation with gradually thickening edges, the formation of granulations, and the extension of the disease to the underlying bone. Valuable evidence, however, is to be derived from an histological and bacteriological examination of the pus which is being secreted. Milligan adopts the following method: after stopping antiseptic treatment for a few days, the external auditory meatus is mopped out with sterilised wool. Discharge is then drawn out from the middle ear by means of a suction apparatus, and a drop is placed upon a cover-glass. Pressure is applied by means of a second cover-slip, and the two are then dried, stained, and examined.

The characteristics of the cellular elements are first taken into consideration and afterwards the nature of the bacteria. If there is an extensive leucocytosis, along with degenerated columnar epithelium and but few lymphocytes, the conclusion that must be come to is that the process is superficial, exudative, limited to the mucous membrane, and is capable of arrest by means of efficient local treatment. On the other hand, the presence of a number of lymphocytes is indicative of granulomatous changes in the mucosa, changes which suggest an extension of the inflammatory process to the deeper layers of the mucosa, and changes which are unlikely to be arrested by any form of purely local medication. The finding of large numbers of flattened polyhedral acid-fast squames is diagnostic of cholesteatomatous degeneration. As the chronicity becomes more established, the epithelial cells assume the flattened and pavement variety, and the presence of myelocytes suggest the existence of bone disease. If, in addition, epithelioid cells and giant cells are present, tuberculous disease must be suspected.

An analysis of the organisms found is also regarded as of great practical importance, as they have a varying degree of pathogenicity. The most virulent in Milligan's experience are the diplococci, including the meningococcus, the gonococcus, and the *Diplococcus catarrhalis*, and the Gram positive pneumococcus. The proclivity of these organisms to produce intracranial complications demands attention. The *Streptococcus pyogenes* is also an organism which may cause severe and often fatal complications, demanding immediate surgical interference. The staphylococci, on the other hand, are much less virulent, and in many of these cases purely local medication may suffice. The information derived from an examination of this kind is of more practical value than the more or less generally accepted "time limit" method of dealing with these cases. Moreover, it must be recognised that a case may be chronic at a comparatively early stage of the disease, because these deep-seated changes may have taken place early in the affection.

The Use of Formidine in Affections of the Ear, Nose, and Throat.

Otto Stein reports upon his experience of the use of a preparation called methylene disalicylic acid iodide, or formidine, which is regarded as a better preparation than iodoform (*Laryngoscope*, St. Louis, 1907, June). The powder is very finely divided, and is useful for impregnating gauze. It is not unpleasant to work with, and is practically devoid of odour. It does not cause dermatitis, and does not stain the tissues. Stein has used it as a powder for insufflation, as a 25 per cent. mixture in glycerin, as a formidine gauze, and as a 2 per cent. and 20 per cent. formidine ointment. In the powdered form it has been used on operated surfaces, such as wounds of the nasal mucous membrane and after mastoid operations; in chronic middle-ear suppuration also, and upon tuberculous and syphilitic granulations. The liberation of formic aldehyde does not seem to provoke very much discomfort in the nose, and this Stein explains on the ground of its very gradual liberation. The gauze is prepared by dusting plain sterile gauze with the powder, and it forms a very useful dressing in middle-ear suppurations. In the treatment of atrophic rhinitis, the nasal cavities are packed with wool tampons, covered with the ointment or the glycerin mixture. The drug is thus kept in contact with the tissues, allowing of a prolonged action.

PNEUMATIC MASSAGE IN THE TREATMENT OF CHRONIC MIDDLE-EAR CATARRH.

MACLEOD YEARSLEY publishes his results in the treatment of chronic middle-ear catarrh by pneumo-massage (*Journ. Laryngol.*, London, 1907, October). Fifty-nine cases, or 117 ears, in eighty-six of which there was tinnitus, were treated in this way. Permanent improvement in the hearing occurred in fifty ears; the tinnitus was diminished in forty out of the eighty-six, and completely relieved in twenty out of eighty-six. In five ears there was fixation of the malleus, and after that bone had been mobilised under nitrous oxide anæsthesia, pneumo-massage was found of great service in maintaining the recovered mobility. In all these cases massage was used as an adjunct to inflation and intra-tympanic injection. In several cases, however, it was not started until other methods, and especially inflation, had been given a trial. In one case catheterisation failed to improve the left ear, but immediately after massage was commenced, the hearing began to improve. In twenty-four ears marked improvement only commenced when massage was used, although inflation had been given a fair trial. Rapidity of vibration he regards as much more important than length of stroke. The piston excursion should not exceed 2 mm. or at most 2½. The first application with the electro-motor masseur should not exceed ten seconds. Both speed and length of application can then be gradually increased, the latter up to two and a half minutes.

PUBLIC HEALTH

UNDER THE CHARGE OF

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BACTERIOLOGICAL EXAMINATION IN THE DIAGNOSIS OF INFECTIOUS DISEASE.

IN the "Report of the Bacteriological Department of the State Laboratory of Hygiene," published in the "Report of the Board of Health of the State of New Jersey for the Year 1906," the attention of practitioners is very pointedly directed to the interpretation to be given and the value to be attached to the bacteriological examination of products from cases of infectious disease. As regards diphtheria, it is pointed out that "persons having the bacillus of diphtheria in their throats or noses, and presenting symptoms of the specific toxæmia due to absorption of the metabolic products of the bacillus, but showing no symptoms indicating a departure from health, while they cannot be regarded as having the disease, are capable of acting as sources of infection, and should be treated as such." Negative bacteriological results from cases which are undoubted clinical diphtheria are due to a variety of causes, and a second specimen should always be sent after a negative report if the case is suspicious from a clinical standpoint. In order to find out when a patient ceases to be infective, the specimens for examination should be taken both from the throat and nose, and "it is very desirable that two *consecutive* negative reports should be received before the patient is released from quarantine," as it has been shown that in a considerable number of cases diphtheria bacilli have been found after one negative result has been obtained. As regards the presence in swabs of bacilli, not positively identified as diphtheria bacilli, while subsequent swabs as a rule prove these organisms to be other than true diphtheria bacilli, it occasionally happens that a second specimen will show typical diphtheria bacilli.

With reference to the examination of sputa for the *Bacillus tuberculosis*, "it should always be borne in mind that while the discovery of the tubercle bacillus in the sputum of a patient is certain evidence of tuberculosis, yet a single negative result is of little value." A point strongly insisted upon is that there is little or no relation between the number of bacilli present in a single specimen and the stage of the disease. The report states that requests are frequently received for an estimate of the number of bacilli present in a given specimen, or for a comparison between the numbers present in two or more specimens from the same case, and that while formerly it has been customary to give this information when possible, it will not be done in future in the State Laboratory, "as it is believed that erroneous and misleading conclusions are frequently drawn from these reports."

In reporting on the examination of blood specimens from cases of suspected typhoid fever, they, as is commonly done in this country, divide the results into three groups, namely—(1) Positive, (2) negative, and (3) atypical (doubtful), *i.e.* where agglutination is imperfect, the reaction not being complete within the specified time. A positive result from a suspected case "is almost certain evidence that the patient is suffering from, or has experienced in the past, an invasion of the typhoid bacillus." A negative result has comparatively little significance, as cases frequently occur in which the result is delayed, or absent altogether, while a negative result from specimens before the fifth or sixth day of the disease have no significance whatever. Atypical reactions have no meaning. Subsequently specimens may turn out to be either positive or negative.

These statements, which are based upon the results of large numbers of examinations of swabs, sputa, and blood specimens, accord with the experience of bacteriologists in this country and elsewhere, and give in a succinct form a rational interpretation of laboratory results as applied to the diagnosis of these diseases.

DISINFECTION OF LARGE APARTMENTS BY FORMALDEHYDE.

LEMOINE and SACQUEPÉE (*Rev. d. hyg.*, Paris, tome xxix. No. 7) have made a number of experiments with the object of ascertaining the efficacy of formaldehyde as a disinfectant for large apartments, such as are suited for the accommodation of a large number of persons. It is the general rule to study experimentally the effect of disinfection on apartments of comparatively small size, of, say, 100 metres cube, and to assume that what holds good for the smaller experimental chamber will hold good for the case of larger buildings. For example, if with a given apparatus it is found that 1 litre of formalin is sufficient for a room of 100 metres cube, it is assumed that an apartment of 1000 metres cube would be certainly disinfected by the employment of 10 litres of formalin. It was to test this "multiplying" rule that the authors undertook their experiments. They conducted their experiments in a ward of 884 metres cube, having two doors opposite one another and eight windows also opposite one another. The ward contained twenty-two beds with their bedding, and was prepared for disinfection in the ordinary way by pasting up with bands of paper the openings of windows, doors, etc.

With the apparatuses experimented with formalin (40 per cent. formaldehyde), either pure or associated with some body destined to hinder polymerisation and consequently increase the efficiency of disinfection, was employed, or trioxymethylene which by the action of heat is transformed into formaldehyde. From the practical point of view the apparatus may be divided into two classes, namely—(1) Those placed outside the apartment, and projecting the vapour of formaldehyde into the room through an aperture; and (2) those placed inside the apartment and increased in number to suit the requirements of the apartment as regards size. The apparatuses employed, and the methods of their employment, were of course previously verified as regards efficiency in disinfecting small rooms.

For each experiment tests were made in different parts of the ward, the test objects being impregnated with *B. typhosus*, *B. diphtheria*, *Staphylococcus pyogenes*, *Streptococcus pyogenes*, sporing anthrax bacilli, *B. subtilis*, and tuberculous sputum. The ward remained shut up for twenty hours, counting from the beginning of the operation of disinfection.

The experiments show that disinfection is most complete with methods employing multiple heaters (for generating the vapour) uniformly distributed in the interior of the room. Applied regularly, the methods which ensure, by their very principle, dissemination of the gas, are as efficacious for large apartments as for those of less dimensions. Less reliable are the different apparatuses of which it is possible to use only a small number or only one. That is not to say that it is *impossible* to obtain a true disinfection of large apartments with a single apparatus, but their experiments show well that the rule of simple multiplication of the disinfectant proportionately to the cubic space is too *simple* and in practice *inaccurate*. In fact, for proper disinfection, it would perhaps be necessary to increase the amount of disinfectant much more than is indicated by simple multiplication, or perhaps it would be possible to succeed by increasing the duration of the disinfecting process, without increasing the amount of disinfectant. Whatever the method employed, the apartment could be reoccupied within twenty-four hours—often much sooner. In all cases, moreover, one ought to employ ammonia to cause the disappearance of the persistent smell of formaldehyde.

There are in the case of large apartments many factors which interfere with methods of formaldehyde disinfection which are perfectly efficient in the case of smaller rooms. In certain methods there is rapid cooling of the jet of formolised vapour in the large room with huge cool wall surfaces. Another important factor seems to be the nature of the product employed along with formalin to ensure the formaldehyde being in the nascent state. This would explain the superior action, as found by the authors, of methods employing trioxymethylene. In these methods also the vapour acts in a dry state, a fact which accords badly with the presently accepted view that moisture is necessary and favours the action of formaldehyde. The most important factor, however, is the feeble diffusibility of formaldehyde. In the methods with multiple apparatuses, the sources of formol being numerous, diffusion takes place around each of them, and the apartment becomes more uniformly filled with the vapour. On the other hand, a single heater has only one source of vapour, and the diffusion is necessarily less rapid and complete. Undoubtedly projection, in carrying the antiseptic a certain distance, obviates this in part, but only in part. In one experiment, for instance, all the tests placed at the entrance to the ward, at 5 metres from the disinfecting heater, were perfectly sterilised, but at the middle and further end of the ward several tests (*B. subtilis* and sporing anthrax bacilli) remained alive.

REPORTS OF THE MEDICAL SOCIETIES.

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GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*Friday, October* 4, 1907.—Dr. **WALKER DOWNIE**, President, in the chair.—Since last session, the Glasgow Pathological and the Glasgow Clinical Societies had become incorporated with this Society, and Dr. **WALKER DOWNIE**, as first chairman of the united Society, chose as the subject of his presidential address, "The History of the Glasgow Medico-Chirurgical Society and of the other Societies which had become blended with it." The Society was instituted in 1814, under the title of "The Medical and Surgical Society," but after one or two meetings this was altered to "The Glasgow Medical Society," the change probably being made on account of the disputes which then existed as to the right of graduates in medicine at the University to practise surgery in the sphere of control of the Faculty of Physicians and Surgeons without first having obtained the licence of that body. This title was retained until the year 1866. A Society, called the Glasgow Medico-Chirurgical Society, of limited numbers and moderate importance, was founded in 1820 and had become defunct in 1832. In 1844 the Medico-Chirurgical Society had been formed, and it maintained an independent existence, meeting on dates arranged so as not to interfere with the older Society, until 1866. Professor J. Y. Simpson contributed a paper in 1845. In 1866, this Society became absorbed in the larger and older Society, the Glasgow Medical Society, and the name chosen for the united Society was the "Glasgow Medico-Chirurgical Society," the previous objections to the inclusion of surgery in the title having disappeared. In 1868 Mr. Joseph Lister reported to the Society his investigations on the subject of putrefaction and his successful treatment of wounds in the Glasgow Royal Infirmary by the aid of carbolic acid. This occurred twelve months before his transfer to Edinburgh. The Glasgow Pathological Society had been absorbed by the Glasgow Medical Society in 1854, and in 1873 the Glasgow Pathological and Clinical Society was formed. Its numbers were at first limited, and members were admitted by ballot after having first made a communication to the Society. It has had a most useful and vigorous existence, but when it is recognised that only four of its members were not also members of the Glasgow Medico-Chirurgical Society, the reasons for amalgamation appear obvious. This has now happily been consummated, and the present meeting is the first of the new era.

Friday, October 18, 1907.—Dr. **WALKER DOWNIE**, President, in the chair.—Dr. **DAVID COUPER** showed a child æt. 2½ years, suffering from pemphigus vulgaris.—Dr. **J. STODDART BARR** and Dr. **JOHN ROWAN** made a short report upon "An investigation into the frequency and significance of optic neuritis and other vascular changes in the retinæ of patients suffering from purulent disease of the middle ear—with the results of examination of the eyes and ears in 100 consecutive cases." The authors arrived at the following conclusions:—(1) Vascular changes in the fundus are not uncommon in purulent middle-ear disease, there being twenty-seven definite cases in a hundred such, and of these six had definite optic neuritis; (2) the ear affections are specially severe in cases presenting vascular changes in the fundus; (3) the eye condition may be useful as a danger signal in treatment and prognosis. If the eye condition does not improve, a radical operation on the mastoid should be advocated; if it clears up, conservative treatment might be adopted. The authors found no relation between right-sided ocular change and right-sided ear disease. —Dr. A. Maitland Ramsay gave a demonstration on ocular tuberculosis, illustrating it by means of the opaque projector. The case showed tubercle affecting the eyelids, bulbar conjunctiva, cornea, ciliary body, and retina. Phlyctenular conjunctivitis was not included in the series, as he considered the chief element in its causation was the eczematous basis on which it developed. He employed injections of tuberculin both for diagnosis and treatment. The cases, in which he tried "Calmette's ophthalmo-reaction to tuberculin," gave negative results.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL.

Medical Men in Municipal Politics.

EVERY man with an imagination, and an instinct for the craft of government, has his day-dreams of Utopian states, and on occasion he may apply the doctrines of a New Atlantis to the sphere of municipal politics. In such moments the question of civic hygiene comes knocking at the door of his imaginary system, and he sees Bumbledom transfigured into an ideal figure walking hand in hand with Science and Art; illustrating in metaphor the apotheosis of municipal sanity. The ordinary man, with less idealised ambitions, is content to ask himself the question whether or not it is possible to leaven the lay mass by an infusion of medical men and artists into the body politic. It is not for us to deal with the purely artistic side, so sadly neglected by our civic fathers and affecting such a city as Edinburgh more potently than other municipalities, but we may take into consideration the question of the sphere of medical men in municipal politics. That there is such a sphere no one can doubt, and without making an invidious comparison we do not hesitate to say that, considered as a unit, the physician or the surgeon has an experience of, and an insight into, the needs of town or city more definite than the representative of any other commercial or professional interest. With Mr. Herbert Spencer we put the question of self-preservation, considered from the purely hygienic side, first amongst the duties of government. However beautiful may be the superstructure, if the foundations be not sound we cannot hope for satisfactory results. We go so far as to maintain, even at the risk of offending the artistic intelligence, that everything must be sacrificed to the question of civic health. In dealing with this vital problem, it seems desirable that we should not depend even on cultivated lay opinion, but come into close and practical relationship with professional opinion and experience. The ideal would be that on every corporation in the kingdom a certain number of professional men should sit *ex efficio*—these being nominated either by the body of professional men themselves or by some corporate institutions, such as the Royal Colleges in Edinburgh. If this modification of the purely communal method of election is not to be admitted, then the most promising alternative is for public opinion to insist that it is the duty of a certain number of medical men to submit themselves for election in the ordinary way, and it is only by feeling a pressure of public sentiment on the matter that it is likely that a generous response will be made by the members of the medical profession. For though deeply concerned with the higher matters of civic government, the exigencies of professional work are such as to limit the freedom of movement in this direction. A busy practitioner can seldom name the hour when he will be free. He cannot even promise himself an uninterrupted meal, and accordingly there is much truth in the contention put forward by a prominent Edinburgh surgeon, that "no successful doctor can give the time to municipal matters until he is on his last legs." It would not be safe to lay it down as an absolule rule that the more gifted of the profession have the largest practices, but such a generalisation works out right in the long run, although it is not to be deduced from this that because a man enters the Town Council he is therefore to be named an unsuccessful practitioner. We could lay our hands on one or two instances to serve as a contradiction to such a deduction.

This line of thought suggests another difficulty. When a medical man has a seat on the Council, his opinion on matters pertaining to health and hygiene may obtain a disproportionate value, inasmuch as his judgment on professional matters may receive a higher recognition by his lay brethren than by his fellow-practitioners. In every profession there are the half-educated, the superficial, the heretical, and the quack, and the very qualities which have prevented him from earning a status in his profession may urge a man to seek fame or notoriety in other directions. Thus the danger is that municipal bodies are liable to be influenced by pseudo-scientific opinions that might lead to disastrous results. The more the point is considered, the more do our minds swing back to the ideal we have already stated—namely, the presence on municipal bodies of nominees of the profession itself. It might not be easy, but it may not prove over difficult, to discover certain competent men who had the will and the time to give their services for the public good. The only alternative to such a plan, admitting the impossibility of securing competent practitioners to seek the suffrage in the ordinary way, is for the profession to combine in every centre, and, by giving voice to its desire, to control local opinion on all matters affecting public health and general physical sanity. Doctors are popularly supposed to have one common quality—that is the quality of differing, which after all is found in all professional men who have no definite gospel upon which to found their dogmas. But we have yet to learn that the profession agree to differ on the vital questions of hygiene which come under the province of municipalities. Having stated the difficulties of the matter, we can only maintain that on the whole it is for the advantage of the community that medical men should find seats on the local Councils and Corporations of the country, for any possible limitations are considerably overbalanced by the certain good which is likely to accrue from such a representation.

The Birthday Honours.

THE recent list of honours conferred by the King contains, we are glad to see, several names of members of the medical profession.

All must agree that the distinction of K.C.B. conferred on Dr. Thomas Clifford Allbutt is well deserved, while the many friends of Dr. G. T. Beatson, Surgeon to the Western Infirmary, will rejoice that a similar honour has been received by him.

Sir George Beatson, the eldest son of Surgeon-General Beatson, C.B., Honorary Physician to the Queen, was born in 1848, and after taking his B.A. at Cambridge, graduated in Medicine at the University of Edinburgh. From an early period he took an active part and much interest in Volunteer work, at first as a combatant officer, and since 1891 he has devoted himself to the Medical side of the Volunteer service. He organised the Glasgow companies of the Army Medical Corps (Volunteers), and brought them to a high state of efficiency; he is now their Honorary Colonel. From the commencement he did his utmost to make the Glasgow Companies take the first place in the Corps, and their success has been mainly due to his personality and his untiring energy.

He has shown in other ways the great interest he takes in civil and military ambulance work. He has been Chairman of the Council of the St. Andrews Ambulance Association since 1900, and he is a member of Council of the British Red Cross Society; the extension of this latter to Scotland is in great part due to him, and his work has borne fruit in the formation of committees in all the counties of Scotland. He enjoys the distinction of being one of the few Volunteer officers in the country asked to give assistance to the Director-General in devising a plan for organising the medical department of the new territorial army.

He was made a Companion of the Bath in 1902.

Amongst other recipients of honours there are two names of which Edinburgh has reason to be proud. One is that of William M'Ewan, the generous benefactor of the University and donor of the magnificent M'Ewan Hall; and the other is that of Sir William Tupper, G.C.M.G., C.B. Few of the present generation probably knew that Sir Charles Tupper is a Doctor of Medicine of our University, since after graduating he soon entered the field of Canadian politics. After holding various Cabinet posts, he became Prime Minister of the Dominion, and latterly has been better known as the High Commissioner of Canada. His present elevation to the dignity of Privy Councillor will give sincere satisfaction both at home and abroad.

The Post-Graduate Course.

THE recent course in medicine proved highly successful, and this annual feature of academic life in Edinburgh may be regarded as firmly established in favour.

At a recent meeting of the lecturers who took part in providing instruction, some interesting statistics were given as to countries from which those attending the last course had come. The total number of graduates was seventy-seven, and of these twenty-four lived in England and Wales, seventeen in Scotland, and four in Ireland. From abroad Americans were most numerous, and after them Canadians and natives of India; but it is a gratifying feature that representatives were also present from such distant parts as New Zealand, the New Hebrides, Nigeria, China, Persia, and Palestine. Apart from the educational advantages of efficient post-graduate instruction, we believe that a not unimportant feature of such courses is the opportunity they afford of bringing men from widely separated parts of the globe into personal contact not only with their fellow-graduates but also with their teachers. Such personal communication leads to an interchange of views upon many questions of interest about which the practical experience of those who have lived abroad possesses great value.

It may be of interest to note that next year the course will follow closely the lines of those which have preceded it except in a few particulars. One of these changes is of some importance, namely, the institution of a special course devoted wholly to surgery. This will relieve the congestion caused by classes having to be held during the same hours, and also, it is hoped, supply a want by enabling graduates to fill in their whole day with surgical work should they desire to do so.

A CAREER of great promise has been cut short by the untimely death of Mr. A. Mactier Pirrie.

The son of the late Mr. Alexander Pirrie, C.E., he was born in 1882. He obtained his B.Sc. with honours in Anthropology at Edinburgh University in 1904, and qualified as M.B., Ch.B., in 1906. He obtained the Carnegie Research Fellowship in Anthropology, and was appointed Anthropologist to the Wellcome Research Laboratories at the Gordon Memorial College, Khartoum. He went out to the Sudan in the autumn of 1906.

Under the direction of Dr. Andrew Balfour, the Director of the Laboratories, Dr. Pirrie made his first expedition up the Nile to the southern limits of the Sudan, and penetrated to remote parts of the Bahr-el-Ghazal. His second expedition took him to the borders of Abyssinia. On both occasions he passed through some of the most pestilential regions of Africa in connection with certain anthropological and physiological researches, appertaining to tropical diseases, upon which the Laboratories are engaged.

Unfortunately he contracted tropical fever (kala-azar), and was so prostrated as to be compelled to return to England, leaving Khartoum on 17th June last.

He rallied from the effects of the fever from time to time, but was compelled to enter Chalmers' Hospital, Edinburgh, in October. His death took place on 12th November.

ORIGINAL COMMUNICATIONS.

CERTAIN ADAPTATIONS OF PERCUSSION IN THE DIAGNOSIS AND PROGNOSIS OF RESPIRATORY DISEASE.[1]

By R. W. PHILIP, M.A., M.D., F.R.C.P.Ed., *Physician and Lecturer on Clinical Medicine, Royal Infirmary, Edinburgh.*

THE subject of to-day's Clinical Lecture is the great diagnostic and prognostic value of certain adaptations of the method of percussion. The matter is one of immense practical significance. You will find the lessons educible from the facts to be submitted of ready application and service in your clinical work.

The art of percussion, as such, is something like 150 years old. Prior to that time, a vague application of the principle seems to have been in use for the separation broadly between fluid and air in a given space, *e.g.*, within the peritoneal cavity. It was, however, in 1761 that Leopold Auenbrugger, who was then physician to the Spanish Hospital in Vienna, published his little volume,——"Inventum novum ex percussione thoracis humani ut signo abstrusos interni pectoris morbos detegendi." I show you a copy of the first edition, which is now rather a rarity in medical literature.

Auenbrugger's announcement met the common fate of so many discoveries. It made little impression on his contemporaries, either of the Vienna School or elsewhere. This is the more disappointing because the Vienna School, at that time, contained not a few men of distinction, such as Van Swieten and De Haen. His contemporaries seem largely to have ignored the method as hardly worthy of consideration. One physician alone, Stoll, a voluminous writer on medical subjects, regarded the matter in a more serious light, and discussed its value in his Prælectiones. The method, however, received very scant recognition, until—almost a hundred years ago—Corvisart, one of the physicians to Napoleon I., who seems to have quietly practised the method for a long time, published (1808) a translation of Auenbrugger's original volume. The influence of the French translator and the Paris School achieved for percussion what Auenbrugger, fifty years before, had failed to attain.

Nowadays percussion is admittedly one of the most important methods in clinical diagnosis. Variations in application of the method which have occurred, since the time when Auenbrugger himself practised percussion directly with gloved hand, apart from any special instrument, through the time of Piorry's pleximeter and hammer, to our own time with its simple method of immediate percussion by the bare finger on the chest, or mediate finger-on-finger percussion, are well known. The essential principle is the same throughout. In percussing, we endeavour, by means of a sharp stroke or tap on the surface of the body in different regions, to determine the consistence and other physical conditions, more particularly in certain organs, the amount of air present. In addition to this, information is obtained by the feeling of resistance communicated to the fingers.

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[1] A Clinical Lecture, delivered 22nd October 1907.

The sounds produced by the percussing finger are to be registered and interpreted exactly as we do other sounds in nature, apart from the human body. I emphasise this, because an attempt was made by Piorry—an unsuccessful attempt—to individualise the sounds educible over various organs as characteristic of those organs, and to label them accordingly—thus: cardial, pulmonal, intestinal, stomachal, jecoral (hepatic), etc. But as Skoda, another distinguished Vienna physician, rightly emphasises, sounds which percussion produces over the regions of the liver, spleen, heart, lungs, and stomach do not depend upon individual peculiarities in these organs, but upon the physical consistence of the organs, and on the quantity, distribution, and tension of the air present in the regions in which they lie, and upon the force of the percussion stroke. The resistance experienced by the finger varies according to the less or greater compressibility of the organ or organs below. Thus solid organs, or closed sacs containing fluid, offer much resistance, while air-containing organs, such as the lung, offer less.

This rapid preface will suffice to recall to your minds the development of the method of percussion since the date of its first application.

As practised at present, percussion is chiefly used as a means to determine the dimensions and outline of the various organs. We speak of the "normal cardiac dulness," the "normal hepatic, splenic, etc., dulness," and we register by means of percussion any increase in the limits usually occupied by these organs respectively. In the case of solid organs, it is a question of determining the degree of dulness and resistance offered. In the case of the lung, we determine the limits of the organ by the extent of area which yields to percussion what is termed lung resonance.

In what follows it is my purpose to direct your attention specially to the lung. In health, the degree of lung resonance varies, of course, at different levels, according to the section of lung involved. In conditions of disease of lung, percussion serves a double purpose. In the first place, as in health, we endeavour to delimit the dimensions and the outline of the lung as before: and, in the second place, determine, whether over successive segments of lung the percussion resonance is of normal fulness. This last is a delicate procedure, requiring a considerable amount of skill and practice. Fortunately, in the determination, we are commonly able to fall back on the second lung as affording an approximate standard of health. The matter is more difficult when both lungs are involved. Even then, in determining whether the normal degree of resonance is present in a given area, there is commonly some unaffected area for comparison.

I am anxious on the present occasion to explain to you and illustrate certain adaptations of percussion which have seemed to me of peculiar value in the diagnosis of respiratory disease, and more especially of significance in the diagnosis of early changes.

There is a tendency to regard percussion as of relatively slight importance in relation to early changes, as compared with auscultation. This is a grave misconception. I am convinced that it is in large part due to want of refinement in percussion method and lack of practice. It has been my common experience to be told by otherwise competent observers, that no percussion change existed in a given case, where an application of the methods which I am about to discuss with you has proved conclusively, not only to myself, but ultimately to them also, that the facts were otherwise. In a given case, the examination of the chest must be made as complete as possible, and every method used. But were I asked to select one method alone for the determination of an early diagnosis, I should be loath to leave out percussion.

I desire especially to present to you one aspect of percussion of the lung, which up till recently was ignored, and even yet is accorded much less consideration than it deserves. Percussion of the lung differs entirely from percussion of the liver, spleen, and other solid organs in this respect, that while the consistence of the latter organs, and approximately their size, remains unchanged during the operation, it is possible, during percussion of the lung, to alter the condition of the organ, in respect of amount of air contained, to an extraordinary degree, and consequently to alter its percussible dimensions. In the case of the heart, systolic change of shape is momentary and relatively slight, and there is no determinable change in consistence, such as takes place in the lung as it passes from full expiration to full inspiration. This remarkable difference places the lung at once on a separate platform from other organs, so far as percussion methods are concerned.

Because of this, percussion not merely serves as a determinant of the size of the lung, and of the consistence of the lung at a given area,—normal, infiltrated, excavated or otherwise,—but it *affords a most valuable physiological test of the functional activity of the organ.*

In this connection I must recall to your minds, what you are already familiar with from anatomical studies, namely, that the limits of the lung are not coterminous, under ordinary conditions, with the limits of the pleural sac. The reflected layer of pleura in relation to the thoracic wall, diaphragm, etc., reaches considerably farther than does the lung. It is in virtue of this, I need hardly remind you, that the lung is capable of fullest expansion in forced inspiration. It is in virtue of this, at least in part, under the morbid condition known as emphysema, that the chest is capable of the extraordinary expansion with which you are familiar.

The accompanying diagrams recall the great differences which exist between the limits of the lung and those of the reflected pleura. At the bases, laterally, there is so great a difference as from 3 to 4 in., anteriorly about 2 in., and posteriorly about 1½ in. At the apex the difference is less in extent but definite enough.

It seems to me that clinicians have availed themselves too little of the percussion test in relation to the *functional activity* of a given lung. Notably is this true in relation to the *early* diagnosis of infiltrative change. In such case, the degree of disturbance of lung resonance may be very slight at first, and yet there is determinable an appreciable diminution in extent of expansion on the affected side. Here comparison between the two sides is of special moment. An accurate register should be made of the varying degree of lung resonance, and the variations in the percussible limits of lung, during the alternating phases of full expiration and full inspiration. What I have said regarding early infiltrative changes applies also in relation to slighter degrees of effusion into the pleural sac.

To this application of the percussion method I have given the name "Tidal Percussion," to distinguish it from the ordinary procedure.

Passing now to more strictly clinical applications, I wish to-day to afford you illustrations, in the patients before us, of the following points: — (1) The value of tidal percussion. (2) The importance of accurate percussion in the supraclavicular triangle. (3) The best line of percussion for the determination of slight degrees of apical involvement.

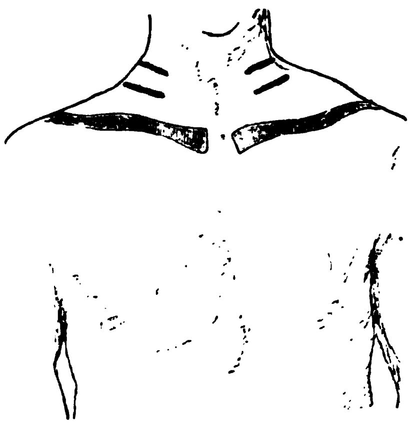

FIG. 1.—Tidal Percussion. The two lines—upper and lower—in the supraclavicular area indicate the limits of lung resonance during full inspiration and full expiration respectively.

1. *The value of tidal percussion.*—I have already explained to you what is implied by the term "Tidal Percussion." It consists essentially in the practice of percussion, alternately during expiration and full inspiration. For early diagnosis, this is to be carried out, particularly at

the apices. It is no less applicable, however, to the bases and the anterior edges. Take any healthy subject, and, on careful application of the test, you will find that the difference between the degree and limits of supraclavicular resonance in expiration, and in full inspiration, is considerable. The accompanying drawing (Fig. 1), reproduced from one of the patients, illustrates the point. The lower line indicates the limit of lung resonance during expiration, and the upper line the limit during full inspiration. These limits are subject to considerable modification in various physiological and pathological states. Thus the sedentary individual, with relatively lazy lungs, offers, on percussion, relatively slight tidal increase of resonance. In his case, the deficiency is probably equal at both apices. In early tuberculous infiltration,—it may be before actual percussion dulness is determinable,—a limitation of the tidal difference at one or other apex may be noticed. As consolidation advances, even in slight degree, limitation of the tidal change becomes more marked. In cases of doubtful diagnosis, the evidence afforded by tidal percussion is of much value. Fig. 2 shows the amount of tidal change to be sufficient on the left side, while on the right side it is much below the normal. In Fig. 3 the tidal change on the right side is fair, while on the left side it is *nil* (the total extent of supraclavicular resonance being actually reduced).

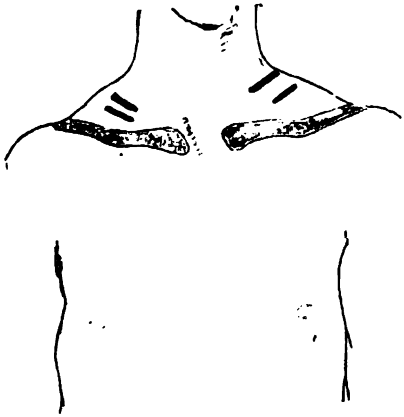

FIG. 2.—Tidal Percussion. Amount of tidal change is sufficient on the left side; it is much below the normal on the right side.

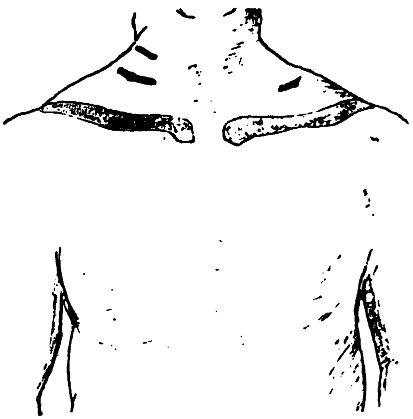

FIG. 3.—Tidal Percussion. Amount of tidal change is fair on the right side; it is *nil* on the left side.

What is true as to the value of tidal percussion at the apex is equally true—and still more evident—in relation to the bases (anteriorly, posteriorly, and laterally).

The practice of tidal percussion should be maintained in relation to the progress of disease. Much information is thereby obtainable in respect of prognosis. As disease becomes arrested, a considerable increase in degree and extent of resonance during full inspiration is frequently observed. Such return of ampler tidal resonance affords one of the most satisfactory indications of improvement. On the other hand, as the disease advances, the amount of tidal percussion difference is reduced still further.

2. *The importance of accurate percussion in the supraclavicular triangle in relation to early changes.*—Many observers are content if they practise supraclavicular percussion over an area of approximately a finger-breadth, immediately above the upper border of the clavicle. If they are satisfied that this area is resonant, and equally so with the corresponding area of the other side, the apex is described as healthy. No attention is given to the ultimate apex. It is forgotten that the normal apex of the lung reaches 1½ to 2 in. above the clavicle. Lung resonance ought really to be determinable in the healthy adult to a like distance above the clavicle. In other words, percussion may be practised some 3 finger-breadths above the upper border of the clavicle.

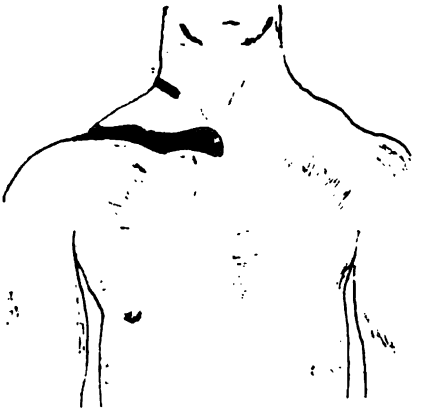
FIG. 4.—Line in right supraclavicular area marks normal upper limit of apical resonance.

Exception has been taken to the statement that the lung reaches so high above the clavicle. It is contended that, on post-mortem examination, the apex of the lung does not extend so high. Such contention, however, overlooks the fact that the limits of the lung after death, and more particularly when the chest is opened, are not the same as the limits of the lung during respiration. As the result of many measurements of the apices of presumably healthy lungs by percussion, I am satisfied that 1½ in. above the clavicle is rather below the mean elevation, and that frequently lung resonance may be traced to 2 in. above the clavicle and even higher. You observe in the patient before us, whose right lung is normal, how high up above the clavicle I obtain lung resonance. Fig. 4, copied from the observation made on this patient before us, illustrates the normal upper limit of apical resonance. For practical purposes, lung resonance may be assumed to reach to the same level on the two sides.

If we admit that lung resonance may be determined in the healthy subject over an area of 3 finger-breadths above the clavicle, let us pass to the results observable in disease. In a given case (Fig. 5),[1] percussion over the lowest finger-breadth may be almost resonant, while that over the second may be much impaired, and that over the third, absolutely dull. Or (Fig. 6) there may be impaired resonance over the first 2 finger-breadths, while the third yields a completely dull percussion sound. Or (Fig. 7) there may be simple impairment over the whole area, and so on. In this connection, comparative percussion, that is, percussion over strictly correspondent areas above the clavicles of the two sides, is essential. By means of this, what might seem to be the gradual tailing away of lung resonance towards the apex may be found to be definite dulness, when compared with the more healthy resonance over the entire area of the other side.

These cases illustrate deviations from the normal which may occur in the supraclavicular triangle in conditions of early infiltrative change, where no dulness is determinable either in the clavicular or infraclavicular areas. Indeed, it may be frequently observed that clavicular and infraclavicular percussion affords full resonance or hyper-resonance in association with varying degrees of supraclavicular dulness. Such complemental resonance is apt to deceive the unwary observer. It ought rather to direct particular attention to the supraclavicular area.

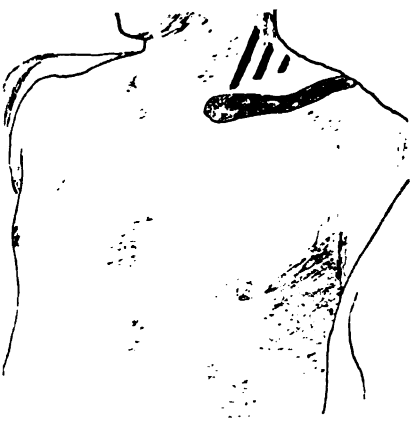

FIG. 5.—Varying degrees of percussion dulness from clavicle to extreme apex.

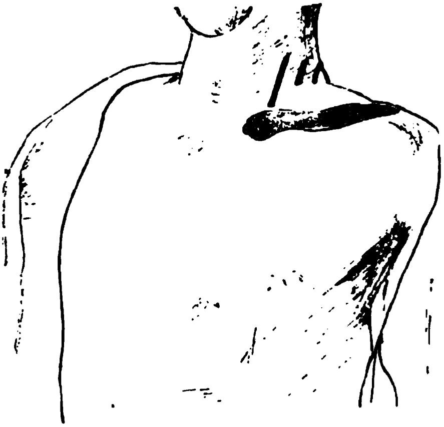

FIG. 6.—Rapid passage from impaired resonance above the clavicle to complete dulness at extreme apex.

3. *The best line of percussion for the determination of slight degrees of apical involvement.*—Let us now pass to an application of the method of percussion which I have proposed for the purpose

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[1] In this and subsequent figures—
1 line (/) = slight dulness in a given area.
2 lines (/ /) = marked dulness.
3 lines (/ / /) = absolute dulness.

of determining early apical change, and which you will find of much value. It forms an important addition to the methods we have already considered.

The procedure is as follows:—The index finger of the left hand is used as pleximeter, and is placed horizontally across the apex of the lung from back to front in a plane at right angles to the vertical diameter of the lung. Percussion is practised with the middle finger of the right hand in a direction at right angles to the pleximeter. The pleximeter finger should be closely apposed, and percussion should be firm and sharp, but not too strong. I show you the method practically on the patients before us. Fig. 8 illustrates the method of procedure.

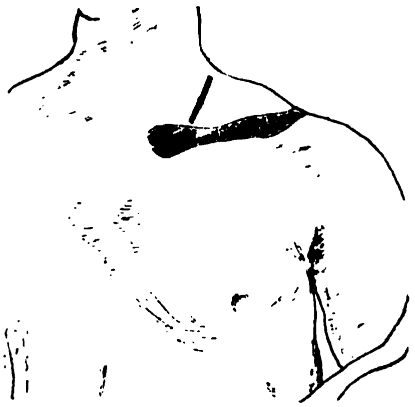

FIG. 7.—Simple impairment of resonance over entire supraclavicular area from clavicle to extreme apex.

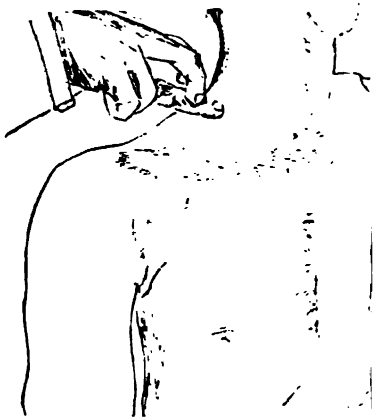

FIG. 8.—Procedure in method for exact determination of fine percussion differences in early apical affections.

In cases where there exists room for doubt as to the integrity of an apex, or of both apices, you will obtain great help from percussion in this line. The delicacy of the test has led me to recommend it strongly at my clinique on the diagnosis of chest disease. Again and again, I have observed competent clinicians fail to determine the presence of slighter degrees of consolidation by the ordinary method, or manifest hesitancy as to their results, and express surprise at the ease and certainty of determination when recourse was had to the percussion line I have proposed.

MUCOCELE OF THE ACCESSORY NASAL SINUSES.

By A. Logan Turner, M.D., F.R.C.S.E., F.R.S.E., *Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh; Lecturer on Diseases of the Ear, Nose, and Throat, Edinburgh University.*

(*Concluded from page* 410.)

Clinical Features.—*The orbital swelling.*—These cases present many points of clinical and pathological interest which merit careful study. As a rule, a swelling in the orbital region is the first thing which draws the patient's attention to the existence of some abnormal condition, and consequently leads him to seek the advice of the oculist. Associated with the swelling, vision may be interfered with. One is at once struck with the slowly progressive character of the swelling, and with the almost complete absence of pain and local tenderness, or indeed with any alteration in the normal appearance of the skin in the orbital region. Inflammatory phenomena, whether in relation to the orbit or to the nasal cavity, are conspicuous by their absence. The occurrence of an acute pyogenic infection, however, such as had evidently taken place in Case 8, will alter the typical clinical picture and convert the mucocele into a pus-containing cavity. Pain, local tenderness, and œdema may then manifest themselves. Although the absence of orbital pain is a characteristic feature of these cases, the symptom is occasionally met with. In Case 2 the patient was conscious of a heavy sensation in the region of the eye; in Case 4 there was severe pain at intervals above the orbit, while in Case 6 occasionally slight pain was complained of. In the remaining seven cases, however, the patients expressed themselves as free from any such discomfort. Onodi (¹) reports a case of ethmoidal mucocele in which there was sometimes slight pain in the frontal region, while Guisez's (²) patient experienced a dull ache, which was increased when the head was bent forward. In Eversbusch's (³) case there was considerable pain in the eye and in the head, but probably in Sprenger's (⁴) patient this symptom was more strikingly marked than in any of the others, as the writer described it as a characteristic feature of the affection. In Kuhnt's patient neuralgic pain formed a prominent feature in the case.

The orbital swelling varies in its situation and size. It occupies the internal and upper part of the orbital cavity, lying immediately below the inner and sometimes even the middle third of the supra-orbital margin; this will depend to some extent upon its size, but mainly upon its origin in the frontal or ethmoidal sinus. The difference in the situation of the frontal and ethmoidal swelling may be too slight to be of any real differential diagnostic value. The extension of the ethmoidal cells in some instances into the orbital plate of the frontal bone, that is to say, into the area usually occupied by the horizontal portion of the frontal sinus, must naturally weaken the diagnostic value of position. In distension of the anterior ethmoidal air space, however, the swelling as a rule occupies that part of the upper eyelid which lies immediately above the inner canthus and beneath the inner third of the supra-orbital margin. In Cases 8 and 9 (ethmoidal mucocele) it is described as occupying the inner third of the upper eyelid immediately above the internal canthus. In the frontal sinus cases, on the other hand, the swelling extends as a rule upwards and outwards in the upper eyelid, involving its middle and inner thirds. Plate VII. Figs. 4 and 1 illustrate the two conditions; Fig. 4 being an ethmoidal and Fig. 1 a frontal sinus mucocele. At the same time it is not always possible by external examination alone to arrive at a definite conclusion as to which sinus is affected; until the cavity has been opened and explored, the surgeon may remain in doubt.

While in the majority of cases,—and this remark applies to all of those recorded above,—the swelling is limited in its distribution to the upper eyelid, it must not be forgotten that in a few exceptional instances the area involved has been considerably greater Thus, alteration in the shape of the nose may be met with.. Lambert Lack (5) describes a case of mucocele of both frontal sinuses, in which, in addition to a swelling in each upper eyelid, the bridge of the nose was much broadened, producing considerable disfigurement. L. Mayer (6) quotes a case of very large cystic distension of the right frontal sinus, in which the swelling occupied the whole right half of the forehead. In Guisez's case of ethmoidal mucocele there was slight enlargement of the root of the nose, more marked on the side corresponding to the affected ethmoidal cells. In a case of a similar nature described by Moure (7), the root of the nose, especially upon the left side, gave the appearance of the nasal bones having been pushed outwards. The external appearance in Moure's patient raised the suspicion in his mind that he might be dealing with a malignant tumour. From these observations it is evident that, while the swelling is confined as a rule to the upper eyelid, it may extend even further and involve both the forehead and the root of the nose.

Differential diagnosis. — The skin covering the swelling presents a normal appearance. An exception to this was found in Case 10, where, on account of an acute inflammatory infection of the mucocele, the eyelids had become reddened and œdematous. Even in this case, however, previous to the onset of the inflammation, the cutaneous covering showed no change from the normal. On palpation the following points may be recognised. One is at once struck with the absence of tenderness associated with the handling of the parts, differing in this respect from those cases of frontal and ethmoidal sinus affection in which an acute inflammatory condition is present. The consistence of the swelling varies somewhat in different cases. In all the ten cases recorded here, a soft, elastic, or semi-fluctuating swelling was palpated; this varied in size from an area which could be covered by the end of the little finger to one upon which the ends of two fingers could be placed. It is sometimes possible to define a distinct bony edge at the margin of the softer portion of the swelling, clearly giving the impression that a gap exists in the bony wall of the sinus. Towards the periphery a thickened zone of osseous consistence is sometimes felt, resembling to the touch an exostosis. In four of the ten cases (2, 3, 4, 9) this could be easily felt at the anterior or nasal margin of the swelling, while at its centre or most prominent part the finger could palpate the softer elastic portion. The nature of these changes will be dealt with when we are considering the pathology of the affection. In a case of frontal sinus mucocele published by Luc (8) the base of the swelling was of the nature of a hyperostosis; Hulke (9) describes the local condition in one of his cases as follows:—"The swelling had a bony firmness, and its nasal border was continuous with the nasal process of the superior maxilla . . . above this hard prominent part of the tumour, between it and the eyeball, a deeper, rounder, elastic portion could be felt." Griffiths (10) states in the description of his case, that the swelling was hard and craggy, resembling an exostosis, save in one situation where fluctuation was felt; and Jessop (11) notes that the bone both at the upper and lower margins of the swelling was thickened and nodulated. It is evident from this description that a difficulty may arise in differentiating the orbital swelling from an exostosis, especially in the earlier stage of the affection before a fluctuating area can be palpated. The exostosis too may have its attachment within the frontal sinus. The presence of the soft elastic area, however, is a valuable aid in the diagnosis of a mucocele of the sinus, indicating as it does that the bony wall of the cavity has become absorbed, and that its contents are in contact with the orbital tissues. Even before the bony shell has disappeared, there may be a slight degree of compressibility not apparent in an exostosis or fibrous tumour, which also assists in the diagnosis. In Case 7 the swelling was of a soft, semi-solid consistence, yielding slightly on pressure. It was found at the operation that the floor of the frontal sinus was very thin, but had not given way. The parchment-like crackling of the thin bony wall, which has been described in connection with dental cysts, was not present in this case, the only one of the series in which absorption of the bone had not taken place.

Cystic dilatation of the tear sac may occur, and simulate to some extent a sinus mucocele. In the former the swelling may be made slightly smaller by pressure, the mucus being expressed into the nose. Again, the tears do not escape normally and tend to flow over on to the cheek, though, as we shall see, epiphora may occur in connection with a mucocele of the sinus. Dermoid cysts occur rarely in this region, being more common in the outer angle of the orbit; as they are of congenital origin, the history of the case will assist in clearing up the diagnosis. The dermoid cyst, however, may be incorporated with the periosteum and invade and absorb the bony wall of the sinus, finally expanding it. Steiner refers to a case of the kind which is reported by Gilibert; but the meagre account that is given does not seem to justify any conclusion being drawn as to its exact nature.

It is questionable whether all the cases which have been described and figured as simple distensions of the frontal sinus are really such, and whether a diagnosis of malignant disease would not have been more applicable to the condition. Luc (12) has published a case which presented appearances more or less identical with those of mucocele of the frontal sinus; but, after opening the distended cavity, he found, in addition to a small quantity of opalescent colloid fluid, a substance which proved to be of a sarcomatous nature. Prochnow (13) also has related two cases of distension of the frontal sinus, both of which are of very considerable interest in this connection. In the first case, the after-history went to prove that a malignant condition was present. In the second, operation disclosed the presence of an osteoma growing from the interior of the frontal sinus. In Langenbeck and Barckhausen's patient, a young girl, æt. 17, the swelling extended upwards on to the forehead as high as the coronal suture; the final history of this case would be one of considerable interest. Brun describes and figures a case of enormous distension of the left frontal sinus in a very young girl. At the operation a quantity of bloody serum escaped from the cavity. The swelling continued to increase in size, headaches supervened, the eye became implicated, and the patient rapidly lost health and succumbed. Although no microscopic data are furnished, the clinical history of the case suggests the existence of a malignant condition.

Displacement of the eyeball.—A varying but by no means infrequent result of the accumulation within the frontal and ethmoidal sinuses is to be found in an alteration in the position of the eyeball upon the affected side. In seven of the ten cases here detailed this was observed. Displacement was present in six of the seven cases of frontal mucocele, being absent only in Case 5, in which the orbital swelling had merely been noticed for six weeks; in the cases in which there was displacement, the swelling had existed for a much longer period. Displacement of the eyeball was observed in one of the three cases of ethmoidal mucocele, namely, in Case 10, in which the acute inflammatory phenomena had developed. In five of the seven cases the displacement was forwards, downwards, and outwards; in one forwards and downwards, and in one outwards and downwards. Alteration in the position of the eyeball depends primarily upon the size of the orbital swelling; the variety of the displacement will be influenced by the position of the swelling in the wall of the orbit and by the extent to which the affected sinus is developed along the roof of that cavity. In the three cases in which there was no displacement, the orbital swelling was a small one. The forward displacement or proptosis, which is rather a characteristic feature, and which was observed in six out of the seven instances, is undoubtedly due to the fact that the affected sinus extends backwards for a considerable distance along the roof of the orbit, so that when the mucous contents escape into the orbital cavity after the bony floor has given way, the eyeball is projected forwards. In all the cases with proptosis, the backward extension of the sinus towards the apex of the orbit was clearly evident at the operation. Proptosis is not confined to the cases of frontal sinus mucocele. It occurs too where the ethmoidal cells are affected. It was present in Case 10, and has been noted in other recorded cases as a frequent phenomenon. We have already indicated how the ethmoidal cells may extend outwards and backwards into the roof of the orbit, so that it is not difficult to understand how proptosis of the eyeball may accompany both the ethmoidal and frontal affections. One must be careful, therefore, not to attach too much diagnostic importance to the variety of displacement met with in these cases. Undoubtedly in frontal cases a downward displacement is usually present,—it accompanied all the six cases in this series,—while in ethmoidal mucocele it has been much less frequently noted. As a consequence of the orbital swelling and displacement, the palpebral fissure is narrowed and occupies a lower plane than that of the opposite non-affected side. In a case recorded by Silcock (14) the pupil upon the affected side lay upon a plane corresponding to the mid point between the root of the nose and its tip. Killian (15) quotes the cases of Barckhausen and Garreau, in which the eyeball was displaced downwards to the level of the tip of the nose.

Notwithstanding the swelling and the alteration in the position of the globe, the movements of the eyeball may not be interfered with at all, or only to a slight extent. In Case 1, where there was forward, downward, and outward displacement, the movements of the globe were slightly restricted, but in none of the other cases was any limitation in movement noted. Even in Silcock's case the ocular movements were remarkably good, with the exception of upward rotation.

Disturbance in vision.—When interference with vision is met with in these cases it takes the form of diplopia, but even when there is considerable displacement of the globe this functional derangement may not be present. Of the ten cases of mucocele recorded here, seven were associated with an alteration in the position of the globe, yet in only three of them was double vision complained of. This percentage is a little fallacious, because it must not be assumed that in the remaining four there was no diplopia; in one instance the patient was blind on the affected side as the result of a staphyloma, while in another no note had been made as to whether diplopia existed or not. In the remaining two, however, there was no diplopia associated with the displaced eyeball. In none of the three cases in which there was no displacement was any double vision complained of. We have not met with any other disturbance of vision. The fundus does not show any pathological change as a rule. In only one of the series Sym noted some fulness of the veins of the disc on the affected side. In Ewetzky's (16) patient the papilla was œdematous, and the veins hyperæmic. Eversbusch noted a greater tortuosity of the veins, especially in the lower half of the papilla. The normal condition of the fundus in the cases of proptosis due to distension of the air sinuses is of assistance in diagnosis. In retrobulbar tumours associated with exophthalmos there is implication of the optic nerve with alteration in the ophthalmoscopic appearances. Consequently, when there is some doubt as to the cause of the proptosis, the normal appearance of the fundus would be against the presence of a retrobulbar tumour.

Epiphora.—I wish to draw attention to an early symptom complained of by two of the patients, the one with a frontal and the other with an ethmoidal mucocele (Cases 4 and 9). In the former, the eye upon the affected side commenced to water especially after reading, three months before the patient noticed any change in the position of the eyeball, indeed it was the first definite symptom complained of. In Case 9, a mucocele of the right ethmoidal labyrinth, the patient first sought advice on account of the tears running over her cheek. Probes were passed down the tear duct, and not very long afterwards she observed a swelling at the inner canthus of the right eye. In both these cases, therefore, epiphora preceded the appearance of the orbital swelling. It is possible that more careful questioning of the other patients might have elicited the fact that watering of the eye had been noticed in the earlier history of their complaint. A search through the literature dealing with this form of sinus affection supplies us with further reference to this clinical phenomenon. In a case of ethmoidal mucocele described by Gibert (17) watering of the eye was the first symptom. In one of Hulke's patients epiphora had been an early symptom. Killian, however, in his description of this affection, makes no reference to the symptom. Guisez's patient, however, also with an ethmoidal mucocele, complained of the eye on the affected side watering; this was not the first symptom, as the patient had already noticed that the upper eyelid had become swollen at its inner end, and that sometimes the vision in the corresponding eye was impaired. In Gibert's case epiphora seemed to be coincident with the appearance of a very small swelling at the inner angle of the orbit. This case also was one of ethmoidal mucocele. As the orbital swelling increased in size, the watering of the eye became more profuse. In Baurowicz's (18) case of ethmoidal mucocele there was a considerable degree of epiphora, but this was associated with pretty marked displacement of the eyeball outwards and forwards. The same remark applies to Farlow's patient (19), in whom the eyeball was displaced outwards, forwards, and downwards, and the eyelids were swollen and œdematous. There had been an overflow of tears for some time. In Compaired's case (20) there was also watering of the eye. The main interest of this symptom lies undoubtedly in its existence in those cases in which there is no other clinical sign suggesting a sinus affection. The cause of the epiphora at this stage is not so easy to understand. At a later stage, when a swelling has already formed at the inner angle of the orbit in the region of the canthus, the association of epiphora with the swelling might very naturally lead to a diagnosis of cystic dilatation of the tear sac, the result of a catarrhal inflammation. In the latter condition, the swelling may very often be made smaller by pressure, the mucus being expressed downwards into the nasal cavity, or outwards through the puncta.

EXAMINATION OF THE NASAL CAVITY.—A routine examination of the interior of the nose must be made in all these cases. This may prove entirely negative, or may be of assistance in diagnosis. Careful inquiry into the history sometimes elicits the fact that the patient has been conscious of discharge from the nostril upon the affected side at some period in the course of the affection. Thus in five of the ten cases in the series, a mucous discharge had been noticed. In only one of these apparently was the discharge observed before the swelling appeared in the orbit; this occurred in Case 4, that of the patient to whom special reference has already been made in connection with the occurrence of severe attacks of pain above the eyes. The discharge of mucus was noticed after such an attack. In the remaining four cases, occasional slight discharge occurred at intervals. In none of them, however, was any alteration apparent in the size of the orbital swelling. In no instance did it appear to be of a purulent nature. In none of the ten cases of the series was any nasal discharge observed on rhinoscopy; the absence of any abnormal nasal secretion is indeed one of the characteristic features in these cases.

The intranasal appearances vary in cases of mucocele. The nasal examination may be quite negative and give no additional information regarding the diagnosis. In six of our cases no abnormality was observed, the interior of the nose upon the affected side presenting a perfectly normal appearance. In the remaining four, however, the following points were noted. There was a distinct bulging of the outer wall of the middle meatus into the nasal cavity in three of the cases, one a frontal, the other two ethmoidal sinus affections (Cases 5, 8, 9). In the two latter, the removal of a portion of the bony wall of the nasal swelling was followed by an escape of the mucoid contents of the affected cavity, with consequent diminution in the size of the orbital swelling. In the fourth case (No. 10) upon the removal of the large globular middle turbinated bone, a quantity of pus was evacuated. Attention has already been drawn to the acute pyogenic infection of this ethmoidal mucocele. It is probable that here, just as in a case reported by Bayer, the middle turbinated air space was involved along with the cells of the anterior ethmoidal labyrinth.

A study of the various reported cases emphasises the points to which we have just drawn attention. In some, the nasal examination is negative; in others, again, there is a definite relationship between the swelling in the orbit and that in the nasal cavity. Lothrop (21) records a case of frontal mucocele in which the middle turbinal was pushed inwards against the nasal septum. On removal of a portion of the former, a polypoid-like mass protruded, consisting of a thin sac containing about an ounce of thick, viscid fluid. The escape of this was followed by a diminution in the size of the orbital swelling. In another case reported by Dunn (22), pressure upon the orbital prominence caused a flow of sticky secretion into the nose. Baurowiez describes a case of ethmoidal mucocele, in which the relation between the orbital swelling and a bulging of the outer wall of the middle meatus into the nasal cavity was very clearly defined. Pressure upon the latter with a probe gave a sensation of elasticity, and without the application of any undue force the instrument passed into a cavity from which some greyish-looking fluid escaped. On the following day a quantity of mucoid secretion passed from the nose when the patient sneezed, and very soon all trace of the orbital swelling had disappeared. In Moure's patient there was obstruction of the affected nostril, the nasal cavity containing a smooth, immobile swelling. In Onodi's case there was an occasional nasal discharge throughout the whole period of the affection. A small, round, fluctuating swelling occupied the middle meatus; when this was punctured, a thick mucoid secretion escaped. It is evident, therefore, that an examination of the nasal cavities may be of considerable assistance in the diagnosis of these conditions. On the other hand, the absence of nasal symptoms and signs must not be taken to imply that the orbital swelling is not connected with the nasal cavity or its accessory sinuses.

Etiology and Pathology.—In discussing this part of the subject, we must take into consideration a number of points which will assist us in explaining the clinical phenomena already described, and which may throw some light upon the causation of the condition. Operative interference in these cases makes it quite clear that we have to deal with a similar affection in both the frontal and ethmoidal cavities, and consequently the pathological changes and the causative factors which induce them are probably the same whichever sinus is affected.

Notwithstanding the clinical material which has accumulated, and a careful inquiry into the history of these cases, it is still difficult to establish proof of an etiological factor which can be regarded as common to all of them; while it is not easy to assign the exact cause of the condition in individual cases. It is probable, however, that we are justified in regarding a pre-existing catarrh as the cause of the chronic inflammatory changes which take place in the affected sinuses. In consequence of the catarrh the ostium of the sinus becomes temporarily or permanently obstructed, and there is an accumulation of the mucous contents of the cavity, and gradual thinning and absorption of one or more of its bony walls.

It must be admitted that it is not easy to obtain evidence of a nasal catarrh which may have initiated the changes in the walls and ostium of the sinus. This is doubtless due to the fact that the affection pursues an extremely slow and painless course, making it almost impossible for the patient to recall any event from which he might justly date the commencement of the condition. The analysis of the clinical features in our cases has already shown us that the patient's attention is usually first drawn to the condition by the presence of a swelling in the orbit. The duration of the swelling from the time it was first observed to the date of operation varied in these cases from six weeks—the shortest period—to nine years—the longest period. In the remaining eight, the orbital swelling had been observed, six months (in two cases), nine months, one and a half years, two and a half years, four, five, and eight years respectively. When we remember that the visible swelling is due to a gradual thinning and giving way of one of the walls of the sinus, an alteration which must of necessity occupy some time, the commencement of the condition must considerably antedate the external evidence of its existence. In regard to this point, Killian states that the swelling may show itself from one to two years after the catarrhal condition of the sinus has started, or as long as ten, fifteen, or twenty years, and even, as in one of Kuhnt's (23) patients, twenty-three years. Under these circumstances, it is easy to understand the difficulty that the patient must experience in assigning the initial cause. In our opinion it is equally difficult for the surgeon to draw a correct conclusion as to the duration of the affection in the sinus prior to the appearance of the swelling in the orbit, except in a case in which the cause might be definitely ascribed to an injury.

In eight of our ten cases, no cause was assigned by the patient, nor were we able to find a reason for the condition when inquiring into the history. In Case 5, where the swelling had only been observed for six weeks, the patient was a very intelligent woman, who repeatedly asserted that she had been remarkably free from any nasal trouble. In one (Case 9), the patient had scarlet fever two years prior to the appearance of the orbital swelling. The scarlet fever was complicated with suppuration of both middle ears. The occurrence of one of the exanthemata in connection with the previous history has been mentioned by some of the writers. Thus Eversbusch's patient, a young man of 20, with an ethmoidal mucocele, had measles when 13 years of age; he dated his sinus affection from that time, having observed that his left eye sometimes protruded further than the right one. He had previously suffered, however, from whooping-cough and scarlet fever. Gibert's patient, a girl of 19, with ethmoidal mucocele, had measles at 8 and whooping-cough at 11 years of age; when 17 years old her eye symptoms were first noticed. Farlow regarded an attack of scarlet fever as the etiological factor in his case; the swelling in the left orbit appears to have followed immediately upon the fever. Other instances might be quoted, and if we are to accept the catarrhal theory, as we are certainly prepared to do, it is perfectly reasonable to associate its onset with one of the exanthemata. The occurrence of so many of the cases of mucocele in early life is an additional reason for ascribing them to the exanthemata.

Killian appears to consider that an injury may be an important etiological factor in the production of inflammatory changes in the walls of the sinus. We are unable to bring forward any evidence in support of this from our own experience. In one of the ten cases (Case 6), the patient was struck above the right eye with a soft cap, subsequent to which she observed the swelling in the upper eyelid. It is difficult, however, to conceive any relation in this case between cause and effect, such as a blow from a soft cap and the formation of a mucocele. The injury merely drew the patient's attention more closely to her eye. Although the absence of any traumatic history is a noticeable feature in our cases, several authors are satisfied that they have been able to trace the onset of the symptoms to injury. Thus, in two cases reported by Langenbeck, there was a previous injury; in one, the patient struck her right temple against the edge of a table; in the other, the youth received the stroke of a tennis racket upon the left side of the nose and the left eye. In the latter case, the swelling in the inner angle of the orbit commenced to show itself two years after the blow. Hulke (24) describes a severe injury in one of his cases, with very considerable bruising and swelling of the forehead accompanied by concussion of the brain. A small swelling was first noticed in the inner angle of the orbit two years later. Jessop has recorded the case of a girl who at the age of 8 received a blow in the region of the left eye; two months later a swelling was observed in the inner part of the left upper eyelid.

Guisez and Moure both assign an initial trauma in connection with their cases of mucocele. In the case described by the latter writer, the orbital swelling became evident four years after the blow. Three cases reported very recently are attributed to a similar cause. Compaired reports the case of a young man, æt. 19, who dated his symptoms to a severe blow which he had received upon the root of the nose. It was of such a nature as to cause marked giddiness for some hours, accompanied by dulness in the head, which persisted for several days. There was also profuse hæmorrhage from the nose. About five years later a swelling appeared. Gagen-Torn (25) describes two cases in which a kick from a horse over the lower part of the forehead was regarded as the probable initial cause of a frontal mucocele. Further evidence might be brought in support of a traumatic history, but enough has been said to show that some authors regard an injury as the causal factor. From the severity of the injury in some of these cases, it is possible to conceive that an inflammatory condition might be induced in the lining membrane of the underlying frontal or ethmoidal air cavity, with subsequent obstruction of the nasal outlet.

If an injury be justly regarded as a causative factor in certain cases, it becomes possible to derive some information as to the probable duration of the affection before the orbital swelling is visible. From the foregoing facts in connection with the cases of trauma just quoted, we find that the blow antedated the swelling, in one case by two months, in another by five years, while in two other cases two years had elapsed, and in another four years, between the injury and the appearance of the swelling.

Lambert Lack calls attention to the possibility of a congenital developmental anomaly being the cause in rare instances, and in support of this view cites the case of a boy, æt. 12, with a mucocele of both frontal sinuses. Both cavities had reached an enormous size. The bilateral nature of the affection and the absence of any sign of ethmoidal disease led him to favour this view of the case.

Age and sex.—Reference has already been made at the commencement of this paper both to the age and to the sex in our cases, and emphasis has been laid upon the frequency of the occurrence of the condition in youth and early adult life. This observation is supported by an examination of the cases scattered throughout literature, especially in connection with the ethmoidal affections. In an analysis of twenty-three cases of ethmoidal mucocele which I have been able to investigate in this connection —and this total includes the three cases detailed above—the age of the patient was stated in twenty-two. The majority of them occurred during adolescence. Sixteen were observed between the ages of 12 and 20; five were between 21 and 30; and one, the oldest in the series, was only 32 years of age. As regards the sex in the same series of ethmoidal cases, fourteen of the patients were males and eight were females, the sex in one not being stated.

While a considerable number of cases of frontal sinus mucocele have been met with in early life, there are several reported as occurring at a much later period than any of the ethmoidal cases which we have noted. Two of the patients in our series presented themselves for treatment at the ages of 51 and 52 respectively. Mayer ([26]) publishes notes of a patient aged 53. Luc's ([27]) patient was 56, Bellingham's ([28]) 46 years of age. On the other hand, Kuhnt describes an interesting case (Case 10 in his series), which came under examination at the age of 28. The patient suffered from mucocele of the right frontal sinus, and the history indicates that the orbital swelling was first observed in the sixth year of life. If the observation be a correct one, the case must be regarded as the youngest hitherto reported. It is not definitely stated, however, that the swelling was observed at that time by a medical man, so that the observation lacks corroboration. Steiner reports a similar condition in a girl, æt. 7. Walter H. Jessop's patient was 10 years of age. When she was 8 years old a small swelling was noticed in the inner upper angle of the left orbit. Lack's patient with bilateral frontal mucocele was a boy, æt. 12 years.

In connection with affections of the frontal sinus at such an early period of life, it is necessary to refer here to the development of the cavity. The sinus is not present at birth, and it is generally held that its development commences at the end of the first or at the beginning of the second year of life, as an upward expansion of the ethmoid cell labyrinth into the diploë of the frontal bone. In the sixth or seventh year the sinus reaches above the supra-orbital margin, and can be recognised at that age as a distinct cavity in the vertical portion of the frontal bone. Symington ([29]) was unable to find a sinus in the vertical part of the bone in children under 6 years of age, but two fairly well-developed cavities were found in a child of 9 years. In the light of these facts it is somewhat difficult to accept the observation made in Kuhnt's case.

Pathological changes in the walls of the sinus. — As a result of the chronic inflammatory process in the mucous membrane lining the cavity of the sinus and in the subjacent osseous wall, various changes may be observed. The normal mucosa of the frontal and ethmoidal cells forms a thin, delicate membrane, covered with a layer of ciliated epithelium. In the subepithelial tissue clusters of mucous glands are found at intervals. In neither of the cavities, however, are the glands so numerous as they are in the pituitary membrane. The deepest layer of the mucosa forms the periosteum of the underlying bone.

In a few of the published cases of mucocele the authors have described the microscopical changes met with in portions of the wall which has been removed. A detailed account of this has been given by Onodi in a case of ethmoidal mucocele. While the ciliated epithelium was preserved upon some parts of the surface, in other situations it was apparently replaced by several layers of pavement cells. Beneath the epithelium there was a fibrous connective tissue layer with small-cell infiltration, consisting of spindle cells and polynuclear leucocytes. A number of blood vessels were present, and scattered groups of mucous glands were also observed. External to the connective tissue layer there was a thin lamella of bone covered with a periosteum consisting of three to four rows of cells, and loosely connected with the mucous membrane. The periosteum on both sides of the layer of bone was rich in cells, those next to the bone being of the nature of osteoblasts. The wall of the medullary spaces as well as the surface of the osseous layer was smooth, and only in places was there evidence of absorption of the lacunæ. In the wall of one of the medullary spaces an osteoclast cell was seen. Changes of an inflammatory nature therefore were present.

As the microscopical material in connection with mucoceles of the frontal and ethmoidal sinuses is somewhat scanty, reference may fitly be made here to the changes which have been observed in a precisely identical condition of the middle turbinated air cell. The appearances observed in the wall of a mucocele of the middle turbinated bone clearly indicate that a chronic inflammatory process exists both in the lining membrane and in the subjacent bone, the latter undergoing erosion and absorption. Cases reported by Sundholm (30), Stieda (31), Kikuchi (32), and Harmer (33), amongst others, illustrate this. Patches of erosion in the bone are evident, and large bone cells probably of the nature of osteoclasts are seen in considerable numbers in some of the specimens. In one of Sundholm's cases sections made through the wall of a large middle turbinated air cell revealed changes of an inflammatory nature. In the periosteum on either aspect of the bone there were a number of large cells visible. They were especially numerous upon the inner surface, that is to say, upon the inner aspect of the air space, and as the osseous lamella showed patches of erosion, the large bone cells were probably osteoclasts. In several areas the continuity of the bone was destroyed, and the gaps were filled partly by osteoclasts and partly by connective tissue cells. The mucous membrane covering the outer or nasal surface of the bone was thickened. It was fairly rich in small cells, the mucous glands were numerous, while the blood vessels were large and their walls somewhat thickened. Gibert describes the histology of that portion of the wall of an ethmoidal mucocele which occupied the upper eyelid, and in which the osseous lamella had been absorbed. On the surface there were the remains of an epithelial layer consisting here and there of two or three layers of cells partly destroyed; external to this there was a thin zone of connective tissue fibres, and outside that again a denser layer of the same. The wall, therefore, was a fibrous one with some epithelial elements persisting but in great part degenerated.

It is interesting to analyse at this stage the situation and extent of the bone absorption in the series of cases described in this paper. Of the seven cases of mucocele of the frontal sinus, absorption of a part or of the whole floor of the cavity had taken place in six. In one only (Case 7) was the bony floor still intact. In four of the six cases the whole of the floor had been destroyed; in one the greater part of the bone had disappeared, while in the sixth only a small area had been destroyed. In two of the cases, in addition to the disappearance of the inferior or orbital wall of the sinus, absorption of bone had taken place in the posterior or cerebral wall of the cavity. In one of them the bone had disappeared over an area with a diameter of 2 cms., while in the other, the deficiency was considerably larger, representing an area the size of a half-crown piece or rather more than 3 cms. In both these cases the dura mater was exposed, the pulsations of the brain being quite visible in the second one after the frontal sinus had been opened (Case 2). The fluid contents of the mucocele in this case closely resembled in its physical characters cerebro-spinal fluid, and as it pulsated during its escape through the external wound, it was not surprising that it was at first regarded as possibly escaping from the subarachnoid space. Fehling's test applied during the operation did not, however, give any reaction.

Other cases of frontal sinus mucocele have been reported, in which absorption of the posterior wall of the cavity has been observed. Mayer has published notes of a case in which the right frontal lobe of the brain showed a very deep depression due to a cystic condition of the right frontal sinus, the cerebral wall of which had been absorbed. After the operation the brain again expanded. A year later the fluid had reaccumulated, and at the second operation the cyst wall was found adherent to the dura mater.

In none of my cases was there any absorption of the anterior wall of the frontal sinus. This has, however, been described by other writers. In Lack's case the anterior wall of the left frontal sinus was entirely absorbed, and in Kelling's (34) case both anterior and posterior walls had in great part disappeared.

In the three cases of ethmoidal mucocele detailed above, the os planum or lamina papyracea had been more or less destroyed. In two, the whole of the orbital wall of the large cystic cavity appeared to have been absorbed, and in the third there was a hole in the same wall having a diameter of 2 cms.

The absoption of areas of bone in cases of mucocele raises an interesting point in connection with the involvement of more than one sinus in the same patient. In some case, at any rate, there is evidence to show that a communication has been established between the sinuses by absorption of the bone in a contiguous wall.

Goris (35) reports the case of a young man in whom a mucocele involved the left frontal sinus, left anterior ethmoidal cells, and part of the right frontal sinus. Compaired has published a case of bilateral mucocele of the ethmoidal labyrinth. The pathological conditions found in it were of exceptional interest. The mucocele involved almost the whole of the anterior ethmoidal region on both sides. From the history of the case it was evident that the condition had started in the right ethmoidal labyrinth. At the operation a small perforation was found in the perpendicular plate of the ethmoid, evidently the result of erosion and destruction of the bone, and through this the left ethmoidal labyrinth had also become involved. In addition to the perforation in the ethmoidal plate, it was found that the cyst in its growth had perforated the right nasal bone in the neighbourhood of the lachrymal sac. In Moure's case of ethmoidal mucocele, the nasal septum was also perforated. The latter was deflected to the left, that is, to the side of the mucocele. In its growth it had perforated the central plate of the ethmoid, and through this opening, which had a diameter of a one franc piece, the cyst wall projected into the right nasal cavity after the manner of a hernial protrusion. Farlow describes a case which he regarded as one of left fronto-ethmoidal mucocele. The facial deformity was very great, owing to the marked displacement of the eyeball and the œdematous condition of the eyelids. The removal of the middle turbinated was followed by an escape of 3 to 4 oz. of yellowish, tenacious, mucoid fluid, and in order to obtain more efficient drainage, the walls of the ethmoidal cells were broken down. Farlow regarded both the left frontal and ethmoidal sinuses as the seat of the mucocele.

Condition of the ostium frontale and ostium ethmoidale.— Although the appearances observed in the nasal chamber upon anterior rhinoscopy have already been considered, it is necessary to briefly refer here to the condition of the anatomical communication between the mucocele and nasal cavity at the time of the operation. In nine of the cases in the series an external operation was performed; in two of them, unfortunately, no note was made as to whether the communication between the sinus and the nose was patent or occluded. In the remaining seven, no communication could be found in four cases, notwithstanding that a careful search was made with a fine probe passed into the sinus, aided by good illumination. In the remaining three, a probe was easily passed from the sinus downwards into the nasal cavity. It is evident, therefore, that the ostium is not completely occluded in every case, although the accumulation of the contents of the mucocele appears to be as great in the one instance as in the other. There was an entire absence of nasal discharge on rhinoscopy, not only in the cases in which the ostium was found occluded, but also in those in which it was undoubtedly patent. If we carry the analysis a little further and compare the condition found at the operation with the history given by the patient, we find that out of four cases operated upon, in which the patient had complained of occasional discharge, the ostium was readily found in two and could not be found in one, while in the fourth the notes on this point were deficient. On the other hand, of five cases operated upon, in which the patient never complained of discharge, the ostium could not be found in three and was quite patent in the fourth, while in the fifth there was no information regarding it.

Perusal of previously reported cases furnishes evidence to the effect that sometimes a free communication exists between the mucocele and the nose. In one of Knapp's (^{36}) patients, it was found that, immediately after opening the distended ethmoid cavity and evacuating its contents, lotion syringed through the external opening passed downwards into the nasal cavity, and in other cases again no difficulty has been experienced in finding the normal ostium. The explanation of the retention of the contents of the mucocele in those cases in which the ostium is evidently patent, is probably to be found in the fact that it is too thick and viscid to escape through the orifice.

A study of the various pathological changes just described will help to elucidate the clinical phenomena observed. The inflammatory process is a chronic one, and the absorption of bone takes place very slowly, and hence the long-standing history which we obtain in these cases. The soft or fluctuating swelling in the orbit is the result of partial or complete destruction of the bony wall forming the floor of the frontal sinus, or the orbital wall of the ethmoidal labyrinth, with consequent escape of the fluid contents of the mucocele into the orbital cavity. The firm, dense area of osseous consistence which can be palpated in some of these cases in the region of the inner canthus, and which has sometimes been mistaken for an exostosis, is the result of a formative process which is taking place beneath the periosteum covering the outer surface of the bony wall of the mucocele in that situation.

When the term mucocele of an accessory sinus is defined, it is usually stated that there is a distension of the cavity associated with the accumulation of its contents. From personal observation of these cases, I am inclined to regard the so-called distension as more apparent than real, at any rate in some of the cases, as I have been unable always to find positive evidence of it. Knowing as we do the great anatomical variations in the size of the frontal sinus, it becomes very difficult, if not impossible, for us to say, when a mucocele is opened, whether we are dealing with a cavity which can be classed as one having merely anatomical dimensions, or one which has become abnormally increased in size from expansion of one or more of its bony walls. Reference to the notes of the seven cases of frontal sinus mucocele shows that three were regarded as being cavities of average dimensions, while the remaining four are described as exceeding the average size. I have elsewhere given the average measurments of a frontal sinus of normal dimensions, and must refer the reader to them (37).

Again, is not the apparent distension sometimes only the result of the absorption of one or more of the osseous walls of the cavity, and the consequent extrusion of the contents through the deficiency in the bone? In six of the seven cases of frontal mucocele, the swelling in the upper eyelid was due to the accumulation of some of the contents of the sinus within the orbit. In Mayer's case, where there was compression of the frontal lobe of the brain, the posterior wall of the sinus had been entirely absorbed, the pressure being directly due to the contents of the cyst itself.

The secretion within the mucocele. — In the majority of cases the contents of the mucocele are of a thick, tenacious, mucoid consistence. The secretion does not, however, present a uniform appearance in all cases, varying alike in consistence and colour, so that its physical characters vary. The ten cases in this series may be subdivided into two groups, the first numbering eight, in which the contents were found to be of a mucoid character when the sinus was opened. The second group contained two cases in which the contents were distinctly purulent when the sinus was first opened, evidently the result of infection through the nasal cavity. Purulent infection of the cavity may follow upon an incomplete operation, as was the case in two of the patients in this series.

In the eight cases in the first group the fluid was thick, tenacious, and gelatinous in seven; its sticky character sometimes rendering its evacuation from the cavity difficult. Silcock states that it was necessary to use forceps in one of his cases in order to remove lumps of inspissated mucus. In the remaining case, the fluid was of a clear serous-like character, presenting none of the physical characters of mucus, but more resembling cerebrospinal fluid. The colour is also subject to variations; it is usually of a white, opalescent appearance; in one of my cases it closely resembled white brain matter, while in another the fluid was of a greenish-brown colour. To the naked eye the secretion may resemble pus, but on microscopic examination such is not found to be the case. In several cases it has been described as having a greenish appearance, and hence the readiness of mistaking it for pus. In Kelling's case the fluid was of a greyish-brown colour, in Farlow's yellow,—in both being of a sticky, mucoid nature.

Histological, bacteriological, and chemical examinations of the contents of the sinuses have been made in a large number of cases. In none of my cases, however, was any chemical examination made of the fluid. In four cases the fluid was examined microscopically, and in all of them it was found to contain mucus. In only one of the whole series were cholesterin crystals observed. In another, some caseous-looking material removed from the neighbourhood of the ostium frontale was found to consist of inspissated pus infiltrated with lime salts, probably carbonates, and also of some degenerated leucocytes. In this case no bacteria were found, and no growth was obtained on culture media. In another of the cases, from a culture made upon agar, the *Staphylococcus pyogenes albus* was obtained, but this was probably an accidental inoculation made when the fluid was being collected. In another of the cases (Case 5), however, cultures of diplococci were obtained upon broth after twenty-four hours' incubation. They were Gram positive, but there was no growth either upon serum or agar. Under anaerobic conditions there was no growth upon any of these media. The diplococci were non-pathogenic, as proved by inoculation of guinea-pigs.

Brief reference may be made to what has been found by some other observers. Thus, in Moure's case, in which the contents were mucus, there were polynuclear leucocytes present; the fluid was sterile. Onodi describes degenerated epithelial cells filled with fat. Cholesterin crystals were also noted. In Farlow's case there were numerous desquamated cylindrical epithelial cells, a few fatty degenerated cells, and a few leucocytes. No micro-organisms were found. Kelling had the contents of a frontal sinus mucocele examined chemically. It was alkaline to litmus, and contained mucin, alkali-albumin, cholesterin, and fat. There was no sugar, glycogen, or peptone. In Knapp's case, as in one of my own, the fluid was of a serous character. In contained cholesterin. In Gibert's case there were no micro-organisms.

It is not without interest to consider the source of the mucous secretion in this affection of the sinuses. As a rule, it is copious in amount, filling the cavity, and, as we have seen, causing a swelling in the upper eyelid when the bony wall has been destroyed. It is difficult to accurately estimate the amount of fluid contained in a mucocele, as some of it is usually lost at the operation. Grossmann (38) obtained 2 oz. from a frontal sinus, Langenbeck a cupful of secretion, and Keate (39) 4 oz. of fluid. The lining membrane of the ethmoidal and frontal sinuses contains mucous secreting glands, but apparently they are not numerous. Sieur and Jacob (40) state that in the ethmoidal cell labyrinth they are much less numerous than in the pituitary membrane itself. Zuckerkandl figures the lining membrane of the ethmoidal cells, and shows how the mucous glands are scattered, being absent altogether in some parts, while in the frontal sinus they are not numerous. Gibert and Moure, in their description of the histology of the wall of the mucocele, do not refer to the presence of mucous glands. Onodi, however, states that glands were met with in his case, but that they were either empty of secretion, or that their epithelial cells were becoming loosened and detached. When operating upon cases of mucocele, one is struck with the thinness of the lining membrane of the sinus, differing in a marked degree from the thick, often polypoid, appearance of the mucous membrane which is observed in cases of chronic suppuration of the sinus. The explanation of the increase in and accumulation of the secretion in the mucocele is probably to be found in an increased function of the glands in consequence of the inflammatory changes. At a later stage, however, there are atrophic changes in the lining membrane, resulting from the pressure of the accumulation within the cavity, and in these changes the mucous glands participate.

TREATMENT.—In discussing the question of treatment, we must consider the two routes which may be adopted, that is to say, through the nasal cavity or through an external incision. The former procedure should only be undertaken in the event of the swelling showing itself in the nasal cavity, and it will probably be found that such cases are ethmoidal in origin. Care should be taken to establish a large nasal opening by the removal with forceps of as much bone as possible, otherwise the permanence of the drainage is not maintained. Of the ten cases forming this series, only one (Case 8) was treated in this way, and the result proved quite satisfactory, as no reaccumulation had taken place after an interval of four years. In a case of mucocele of the ethmoidal sinus treated by Baurowicz, a cure resulted after an opening had been made in the swelling which presented in the middle meatus. Farlow's case of combined frontal and ethmoidal mucocele, to which reference has already been made, was cured in a similar manner.

In the majority of cases, however, an external operation is to be preferred. This resolves itself into the adoption of one of two methods: either to open the sinus and obliterate the cavity without attempting to make any communication with the nose, or, after opening the sinus, to establish a large communication with the interior of the nose and drain through it, so that a permanent nasal opening remains. Of these two methods, preference must be given to the second. Obliteration of the cavity which necessitates curetting of its lining membrane, and the removal of the anterior bony wall, and probably also the floor, if that has not already been absorbed, is followed in these cases by a good deal of deformity. It is true that paraffin may be injected to overcome this. Delsaux ([41]) reports a case of mucocele of the frontal sinus which he treated successfully in this way. Luc also successfully treated a case of this kind along somewhat similar lines, and made no attempt to open into the nose, and Knapp curetted the interior of an ethmoidal mucocele, inserted a drainage tube through the inner end of his incision, removing it on the seventh day. Recovery was complete and permanent. If the sinus should prove to be a small and shallow one, then obliteration may prove a very satisfactory method of dealing with it. A simple incision into the external swelling without any attempt to effect obliteration will only prove a failure. Either reaccumulation takes place when the opening is allowed to close, or a discharging sinus remains in the upper eyelid, a suppurative condition being set up. A perusal of Hulke's cases, in which treatment was limited to an orbital incision, shows that the openings remained and continued to discharge.

From my experience of these cases, I would advocate the establishment of a large opening between the sinus and the nasal cavity. In the nine cases in which this procedure was carried out, cure resulted in all of them with a minimum of disfigurement. As a preliminary step the middle turbinated bone is removed in some of them. An incision is then made parallel to and beneath the eyebrow, which is left unshaved; the upper eyelid is detached and turned downwards. After the contents of the mucocele have been removed, any portion of the floor of the frontal sinus, or of the outer wall of the ethmoidal labyrinth, which has not already been absorbed, is removed. In some of the cases a small area of the anterior wall of the frontal sinus is also removed. The lining membrane of the cavity is left untouched. The communication with the nasal cavity is then sought for with a fine probe; as already stated, no ostium may be found. Whether the normal ostium be found or not, a large opening into the nose is made by means of burrs, and through this a rubber drainage tube is passed, being held in position in the lowest part of the sinus by a collar formed by turning over its upper end. The lower end of the tube does not quite reach the vestibule of the nose. The sinus is next lightly packed with gauze, the end of which is brought out through the inner end of the incision which is sutured with the exception of this small area. The gauze is removed at the end of four or five days, the cavity is washed out, and if the nasal drainage tube is found to be working satisfactorily, the skin incision is allowed to close in a week or ten days. The bandage is then removed, and the patient can be instructed to wash out the sinus daily by introducing the fine nozzle of a syringe into the nasal end of the drainage tube. The success of the operation will largely depend upon the maintenance of a permanent opening between the sinus and the nose, therefore it is necessary to keep the drainage tube in position for a considerable time. It should not be removed until at least six weeks after the operation. I have found the ordinary rubber drainage tubing prove quite satisfactory, but if it is removed too early there is a tendency for the communication between the sinus and the nasal cavity to close.

I wish to express my great indebtedness to my colleagues in the Eye Department, Mr. George Berry and Drs. George Mackay and W. G. Sym, for their kindness in transferring their cases to my care.

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"PHYSIOLOGICAL ECONOMY IN NUTRITION"—IS NOT A DIFFERENT EXPLANATION POSSIBLE?

By Alexander Haig., M.A., M.D. (Oxon.), *Physician, Metropolitan Hospital, London.*

Those who have made experiments with the process of chewing and automatic swallowing sometimes called Fletcherism, after its inventor, have generally been content to watch it only for periods of six or at most twelve months, and to draw conclusions from the results obtained in such comparatively short periods of time.

I have nothing to say against the practice of complete chewing. It is always a good thing to chew thoroughly and completely all food taken, but when this is accompanied by alterations both in the quantity and quality of the food made use of, we may easily be led into error if we venture to speculate on the causation of the results produced.

It has been claimed that these alterations in chewing, and in the quantity and quality of the food, bring about an increase in strength and endurance in those who practise them. I think I can show that similar changes in strength and endurance result from similar changes in diet, though no alteration in the method of chewing has been made.

For all people who diminish their quantity of flesh foods (and the quantities of these foods are sometimes diminished as much as 80 per cent. by those who practise Fletcherism) find that this gives them for a time an increase both of strength and endurance, as well as lessened stiffness after exertion, a further sign of diminished uric acid. And conversely, as I have pointed out elsewhere, Japanese workmen, who are unaccustomed to flesh food, find that their powers of strength and endurance are at once diminished by taking it; so that if they wish to do their ordinary work they must return to their ordinary food. (See also effects of climate mentioned farther on.) Then, in my own experience, as I say, some increase of strength and power of endurance is practically an invariable result of a change from an ordinary diet of flesh to one consisting chiefly of bread stuffs, milk and cheese, and this without the smallest attention to the process of chewing, and even when the patient is perhaps actually consuming less albumin than is really requisite for the proper nutrition of his body. And yet I have maintained for years and still strongly believe that albumin is a *sine quâ non* of life, and the only source from which muscular energy is derived. What, then, is the explanation of these facts?

I am prepared to acknowledge that when chewing is carefully attended to the microbes get a little less of the food and the man a little more of it, as the result of diminished putrefactive processes in the intestinal canal; but this does not account for the increase of power and endurance, for the same effect is obtained by those who make a similar alteration in diet without any increased attention to the process of mastication. But if albumin is the only source of strength and power, how can a man produce an increase of strength and endurance on a diminished consumption of proteid? The answer is, that the effect of the diet change is to greatly diminish friction in the machinery, especially in the circulation and nutrition of muscles: the reverse effect being shown in the case of the Japanese labourers above mentioned; and further, that if albumin is deficient the patient for a time can draw on his own stores and so loses weight (and the Fletcherising patients do generally lose weight); that such drawing on reserves can go on for various periods of twelve to eighteen or even twenty-four months till the reserves are exhausted, and then, if the albumin income is not increased, a breakdown is sure to result. And many of those who have practised Fletcherism over long periods without increasing albumin will, I believe, confirm this statement.

In all cases nitrogen should be watched over a long period to find the relation (as I believe a constant one) between force produced and nitrogen excreted. Then, as I have pointed out, a fallacy underlies the estimation of the excretion of nitrogen in relation to exercise, for the first effect of exercise is to diminish the output of nitrogen, and this is followed by an increase which more than balances the fall, and shows a rise in the total output as the result of the exercise. It is therefore very dangerous to draw any conclusion from the excretion of nitrogen on the day of exercise; only when it has been observed over several days before and after do we see the real effect of the exertion, and the albumin metabolism that produced it.

The people who make these alterations of diet can produce increase of external force because they diminish internal friction; but the relation of force to nitrogen never alters, and if they have deficient albumin they will first use up their reserves and then break down. I have seen hundreds of instances of this, and have saved many others from a breakdown by insisting on an increase of albumin. This diminished friction on a diet poor in flesh food is at once the cause of the athletic successes of the vegetarians and of the temporary improvement in those who Fletcherise and at the same time diminish their flesh foods, and of the similar improvement of those who diminish flesh foods without any other change.

If the success of Fletcherism is due to the chewing, to what is the similar success of the vegetarians due?

Only within the last few months (July 1907) a long-distance walking match was held at Berlin; for this there were twenty-nine starters, fifteen of them vegetarians and fourteen mixed feeders. Only six men came in at the finish, and of these five were vegetarians and one a mixed feeder, and the mixed feeder was fifth.

We must bear in mind also that diminished proteid diminishes friction by diminishing the formation of uric acid (in the relation of 1 gr. of uric acid for 35 of urea). Therefore diminished proteid is for a time an advantage, but it cannot be kept up, as it eventually produces weakness. It is now, however, I think, acknowledged that diminished taking of flesh increases power and endurance, and we have seen the opposite effect of increasing flesh in the case of the Japanese workmen.[1]

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[1] See also "Health Culture," New York, August 1907, p. 361.

But that uric acid is the cause of this increased friction, and its diminution of the improvement in power and endurance, is shown by the fact that those do best as to power and endurance who not only abstain from meat, but also from tea, coffee, and the pulses, and the only thing common to all these foods is the uric acid element they contain. And as I have pointed out in "Uric Acid," those who fail in endurance have a higher blood pressure than those who succeed, and this high blood pressure is one result of the increased friction. Further, an increase of friction in the circulation is visible, and can be produced by taking any one of the above-named foods and beverages, or even the pure alkaloids of tea, coffee, etc.; there is a visible slowing of the capillary circulation and a corresponding rise of blood pressure as these pass through the blood. And this slowing and rise of blood pressure can be demonstrated at once on anyone (*e.g.* the vegetarians or Battle Creek students) who is moderately free from uric acid; but, of course, it cannot be demonstrated on those who are not free or are constantly swallowing it in flesh, tea, coffee, etc. A small addition to their already large quantities will, of course, fail of effect, just as a man who takes all these things is not made notably worse by an increase of meat, while a Japanese who is moderately free from them at once suffers on taking meat.

One exception to this is seen in warm climates, as parts of India or of China, where the heat and increased perspiration increase the alkalinity of the blood, and then an increase of flesh at once means an increase of uric acid in solution in the circulation. Hence many who go to these climates find that they do best on small quantities of meat, and that any increase diminishes power and endurance,—an interesting fact for an instance of which I am indebted to Dr. F. M. Hallock. In all cases it is a matter of solution in the blood stream, and heat favours this solution, and relative freedom from uric acid (as in the Japanese) does the same.

The conclusion is, I suggest, that Fletcherism increases power and endurance because it leads to both a diminished intake and a diminished formation of uric acid. That the vegetarians and the Battle Creek students succeed for the same reason, and that among them all those do best who most rigidly exclude all uric acid and xanthin, and at the same time take care to consume a normal physiological allowance of albumin. That though a diminished intake of albumin may appear to do good for a time, by diminishing the formation of uric acid in correspondence with a diminution of total nitrogen, yet, as there is a constant relation between nitrogen consumed and force produced, a constant diminution of nitrogenous income leads eventually to bankruptcy and breakdown; but this does not come for a considerable time, till the reserves have all been used up, and this using up of the reserves is generally accompanied by a loss of weight and a falling off in the quality of the blood, which may be looked upon as danger signals. In place of physiological economy in nutrition, I see merely an economy of force in diminished friction, and the force thus economised is available for external power and endurance. No force is ever produced, or ever will be, without the conversion of a *quite definite amount* of the nitrogen of albumin into urea. Such albumin must always be provided; but the less the quantity of the friction causing xanthin or uric acid present in the circulation, the less will be the internal friction, and the greater the amount of force available for external work. And this is all visible in the capillary circulation of the skin, which is quicker with lower blood pressure in those who endure, and slower with higher blood pressure in those who fail.

A CASE OF RAPID PHTHISIS WITH PULMONARY HYPERTROPHIC OSTEO-ARTHROPATHY, IN A CHILD OF SIX.

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(PLATES VIII. AND IX.)

THE following case, which came under the writer's notice in the practice of the Clinique Mackay, Huelva, is of interest not only on account of the infrequency of pulmonary tuberculosis compared to other manifestations of this disease in childhood, but also from the occurrence of that extremely rare condition in the child—pulmonary hypertrophic osteo-arthropathy, and the suggestion of a causal bovine infection. The use of the term "Rapid Phthisis" as applied to this case will be considered later.

CASE.—A. G. B., male child, æt. 6, a patient of Dr. Pedro Seras, Huelva, was first seen on 12th August 1907, complaining of pain in the chest, cough, and vomiting.

FAMILY HISTORY.—The child's parents are both alive and well, as are also the grandparents, and no history of tubercle could be elicited. Patient is the third child, the two previous children being both dead,—the first at one month after three days' "gastric fever," the second at ten months from "bronchitis." The family are in fairly comfortable circumstances.

PATIENT'S HISTORY.—Born weak, the patient was reared at the breast for the first two years. During his first six months of life he was thin and frequently vomited, but when 1 year old appeared to be a healthy child. At the age of 1 he had "swollen throat," and when 2 years old suffered from "gastric fever." (Dr. Macdonald of Huelva informs us that this popular synonym is frequently tantamount to remittent malaria.) The patient's mother is quite certain that during these two years he had absolutely nothing but breast feeding. After this he was given "what was going"—the food mainly consisting of cow's and goat's milk, cow's and goat's flesh, bread, soups, fish, a variety of vegetables and fruits, large quantities of sugar, and a considerable amount of olive oil throughout the entire cuisine. At the age of 3 one of the anterior sterno-mastoid glands on the left side of the neck enlarged, and, when patient was 4, this was opened at the Provincial Hospital, Huelva, and pus let out. Prior to the present illness the child slept well, but always, so the mother noted, with open eyes.

Patient got definitely ill in January 1907, but prior to this was feverish for some time. In January he had pain in the chest with slight cough, and in April 1907 he underwent an operation for pyothorax of the left pleural cavity, when a considerable quantity of pus was removed.

At date of present examination, 12th August, the patient complains of pain, cough, and vomiting. The facies is distinctly tuberculous. The features are well formed, the frontal eminences being unusually prominent. Of pale complexion and thoughtful expression, the patient has fine dark silky hair, growing well forward on the temples, large brown eyes overhung by long eyelashes, with eyebrows which tend to meet in the middle line. The pupils are equal, moderately dilated, while the sclerotics are clear and tinted blue. The child is thin, of poor muscular development, fretful, and highly nervous. Height, 104 cms.; weight, 16·4 kilos. The cough is short, dry, explosive in character, and is worse at night. The patient coughs up a little sputum in the morning, which has never been noted to contain blood. He has pain all over the chest, especially over the right apex. The appetite is poor, vomiting immediately after food is frequent, and there is pain in the stomach after meals. The bowels are irregular—constipation and diarrhœa alternately. He has great sweats at night, has lost weight rapidly, and his sleep is broken by dreams and nightmares. Pulse, 90; respiration, 27.

INSPECTION.—*Thorax.*—The chest is badly formed, flat, cone-shaped, and of greater antero-posterior dimensions below than above. The shoulders are sloping, and supraclavicular hollows are present, increased on inspiration. Over the upper anterior portion of the chest a blue venous network is well marked, and over the sixth left rib in the anterior axillary line there is the scar of a 3-inch incision by which the pyothorax was tapped. This has the red-blue colour of a tuberculous scar, as has also the cicatrix on the left side of the neck. All the muscles show myotatic irritability, and myoidema is well marked on the pectorals and on the spino-scapular muscles. Expansion is diminished at both apices and the breathing is mostly abdominal.

Mensuration.	In Expiration.	Amount of Expansion.
At level of nipples . . .	57 cms.	0·4 cms.
At level of eighth rib . .	56·5 ,,	0·5 ,,
Abdomen at umbilicus . .	56 ,,	0·75 ,,

PALPATION.—When the child cries a marked increase in vocal fremitus is palpable over the entirety of the left lung, and over the upper lobe of the right.

PERCUSSION.—The percussion note is dulled all over the left lung, and over the upper lobe of the right both in front and behind.

AUSCULTATION.—*Left lung.*—Breathing is high pitched, bronchial in character over the entirety of the lung, accompanied here and there by moist râles on expiration. Vocal resonance is increased to ægophony. *Right lung.*—High pitched bronchial breathing over the upper lobe in front and behind. When the child breathes deeply, pleuritic friction is heard, soft in character. Over the middle and lower lobes the breath sounds are weak and feeble in quality. *Sputum.*—This contains tubercle bacilli and elastic fibres.

Heart.—The apex-beat is diffuse, but best felt in the fifth intercostal space in the mid-clavicular line. The base and left border of the heart are normal, but the right heart is considerably dilated, the cardiac dulness extending 3 cms. from the right margin of the sternum, and on expiration the outline of this portion of the heart is apparent against the thoracic wall. On auscultation there is a loud reduplicated second sound, and a soft, blowing, systolic, tricuspid murmur.

Abdomen.—The abdomen is prominent, enlarged, and moderately firm. The umbilical sulcus lies flush with the skin, and the superficial abdominal veins are dilated. In their arrangement these latter show the early "cave-porte" type of Gilbert and Villaret (1) to which reference will later be made. There is no pain on palpation, and no fluid can be detected. The liver is enlarged, extending one fingerbreadth below the right costal margin. The outlines of the stomach are normal, but the mesentery can be felt as a thickened mass lying across the abdomen. No glands are palpable, and the spleen is not enlarged.

Urine.—Sp. gr., 1022; acid reaction, and no abnormal constituents.

Treatment was palliative in view of the obviously hopeless prognosis.

The osseous system presents an absolutely typical picture of pulmonary hypertrophic osteo-arthropathy. The frontal eminences are well marked, but the superior maxillary bones are normal. In the upper extremities there are typical abnormalities of the fingers. These appear lengthened compared to the size of the hand, the proximal and middle phalanges are normal, but the distal phalanges of all the digits are curved antero-posteriorly and thickened, the nails being large and rounded, growing beyond the pulp laterally and over the tip of the finger. They each resemble "a flattened drumstick," to quote Marie's (2) picturesque description (Plate VIII.). The deformities in the lower extremities are more marked (Plate IX. Fig. 1). There is great enlargement of the condyles of the femurs, particularly of the internal condyles, which stand out prominent. The knee-cap is not enlarged, but is carried out in front of the condyles. The whole articulation appears enlarged, and but for the angularity of the deformity and the absence of fluid one is forcibly reminded of Charcot's joint by the large mass standing out from wasted muscles. The tibia and fibula are not enlarged, but the hypertrophy of the internal condyle has brought about a condition of genu valgus, and has produced a compensatory concave inward curve of both tibiæ. The terminal phalanges of the toes present a similar deformity to that of the fingers, and equally well marked (Plate IX. Fig. 2). Before proceeding to a further consideration of the case, it will be well to record the progress of the disease as determined at the next examination on 13th September, one month later.

September 13.—For the last fortnight the patient has coughed up a considerable quantity of nummular sputum, has been fevered, and has coughed more. The left lung is unaltered. Over the upper and middle lobes of the right lung there is high-pitched bronchial breathing, with loud sonorous rhonchi on expiration, and extremely loud pleuritic friction. Over the lower lobe, inspiration is harsh, and at the base of the lower lobe behind there is fine pleuritic friction giving the "bruit cuivre." Pulse, 120; temperature, 97°·5 Fahr.

September 14.—Over the lower right lobes there are fine crepitations on inspiration. Pulse, 132; temperature, 97°·4 Fahr.

September 23.—The condition of the lung is the same, except for the cessation of pleuritic friction over the upper lobes of the right lung, and the appearance of medium moist râles in the lower lobe of the same lung. Pulse, 140; respirations, 48. Further, a swelling has appeared at the lower border of the right pectoralis major muscle and in the lower right quadrant of the mamma. It was noticed three days ago, is the size of a hen's egg, is tender on pressure, and apparently is an infected gland.

October 16.—Swelling was opened 30th September by a "practicante,"[1] and wound is now a discharging tubercular sinus.

REMARKS.—It is clear that in this case we are dealing with a grave form of pulmonary tuberculosis, which threatens to destroy life in the space of a few weeks. Were one to attempt the definition of the extent of the disease by an anatomical classification, as that of Turban, it would be recorded under "Stadium III.,"—that is, severe disease affecting two or more lobes of the lung; but when one remembers that the patient got ill in January and that eight months later both lungs are infected in every lobe, the limitations of an anatomical classification as applied to a clinical pathological process are surely apparent. For, while this patient would be registered under "Stadium III.," so also would be an old-standing case with vomicæ in both lungs; and further, such a nomenclature is incompetent to express the pathological process at work in different portions of the lungs, as here elicited by the physical signs—congestion, catarrh, and consolidation; nor can it give the faintest suggestion of the dire rapidity of the disease. If now we turn to the pathological nomenclature of pulmonary tuberculosis, according to Osler, the case is still difficult to class. Osler (3) groups pulmonary tuberculosis under "(1) Tuberculo-

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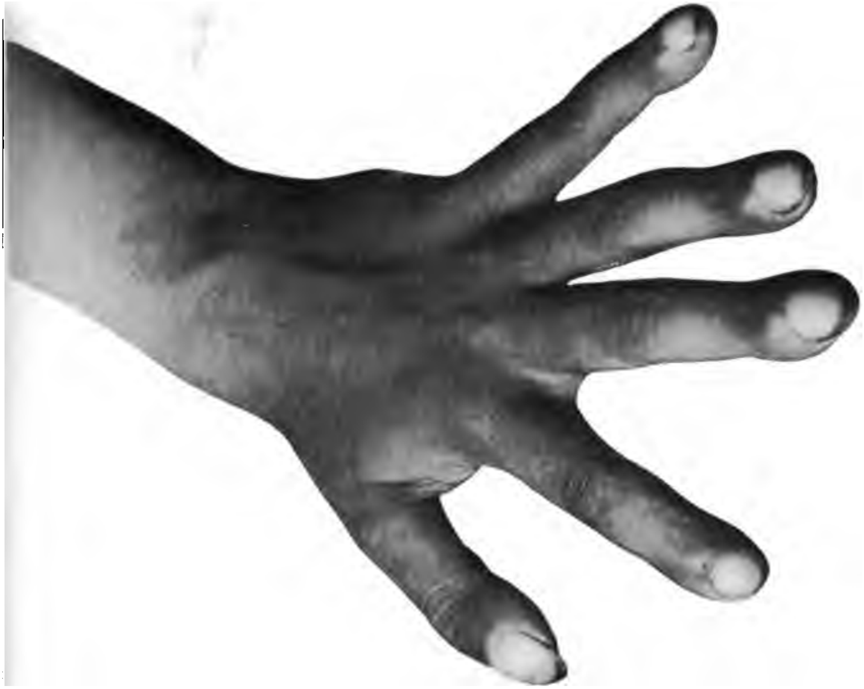
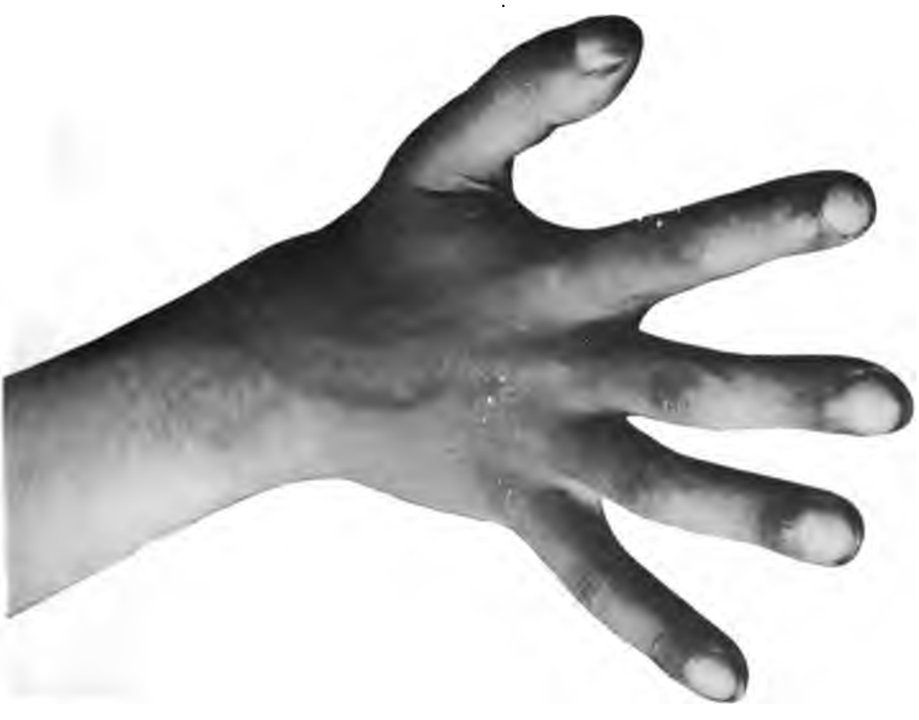
[1] A "practicante" is a practitioner corresponding to the old apothecary.





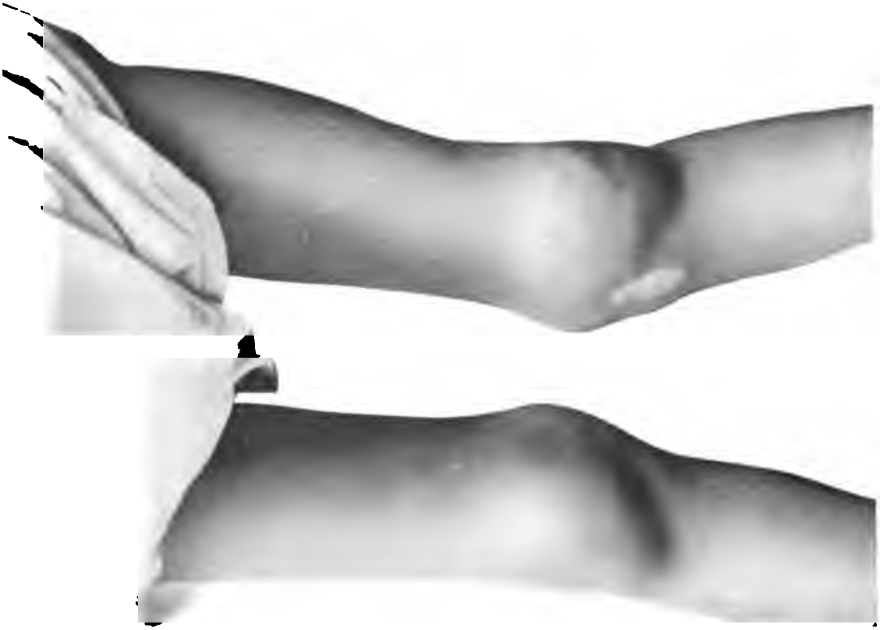


Fig. 1.

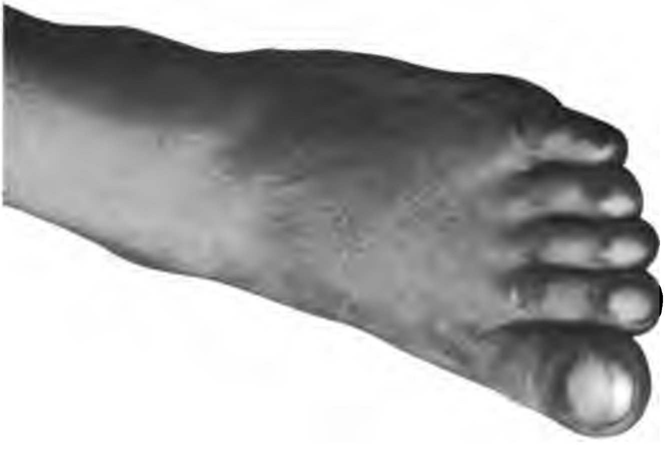


Fig. 2.

pneumonic phthisis—acute phthisis; (2) chronic ulcerative phthisis; and (3) fibroid phthisis." The second and third are at once ruled out of court, for the disease is neither chronic ulcerative phthisis, nor is it this condition with an acute tuberculous pneumonia superimposed. One is left with Group 1, "acute phthisis, galloping consumption, or phthisis florida," and in this group two types are recognised—

(*a*) Pneumonic form, whose onset resembles that of lobar pneumonia, and where death may occur in three weeks, or the case pass into one of chronic phthisis. It is pathologically a lobar pneumonia, due to the pneumatogenous distribution of tubercle bacilli.

(*b*) Acute tuberculous broncho-pneumonia, resembling catarrhal pneumonia, and where also death may occur in a few days or weeks, or the case become chronic. Pathologically it is a catarrhal pneumonia of tuberculous origin, the pneumatogenous miliary tuberculosis of Ziegler ([4]).

From this brief but sufficient summary of the classification as present in use, it would seem that a clinical group is yet wanting for cases such as the present. We have the disease coming on in the left lung, rapidly extending by the lymphatics, as indicated by the tuberculous pleurisy and exudation, and now spreading throughout the entirety of the right lung. When first seen the upper lobe alone was solid, but a month later the middle lobe had undergone consolidation, its pleura was the seat of tuberculous inflammation, and the lower right lobe was also involved. In its totality we find that this case in nine months has traversed those stages through which chronic phthisis may pass, it may be, for years, and excepting the difference in time, it appears to the writer that the two present a striking similarity, both clinically and pathologically. Under chronic pulmonary tuberculosis, Ziegler ([4]) described the following pathological entity as a virulent form of the disease:—

"In other cases the disease is virulent from the outset, inasmuch as the tuberculous patches speedily become caseous and softened, with little tendency to the formation of firm fibrous tissue. Rapid disintegration of the affected parts is the natural result, cavities are soon produced, and the metastases that are formed tend in like manner to undergo caseous degeneration. The outcome is that in a very short space of time the lung is studded with caseous patches and riddled with cavities. The process might thus be termed *caseative* or *ulcerative caseous tuberculosis*; clinically, it is sometimes spoken of as phthisis florida. From its pathogenesis it might be called *nodular caseous tuberculous broncho-pneumonia.* The softening and disintegration of the pulmonary tissue are sometimes so extreme that the process almost resembles rapid suppuration.

"In this form of tuberculosis the separate patches are usually larger than they are in the indurative form, and they readily coalesce to form still larger patches. Not uncommonly the infiltration spreads about the lesions over entire lobules or groups of contiguous lobules, which thus become at first greyish-red, then undergo grey hepatisation, and finally turn yellowish, opaque, and caseous. In this way the *nodular* variety passes into *caseous lobular broncho-pneumonia.* By the coalescence of many such infiltrated lobules an entire lobe may become caseous, and the result is occasionally described as *caseous lobar pneumonia.*"

It is submitted that the physical signs of the case under consideration are not in discord with the above pathological condition. One may recall a similar case seen in the Liverpool Hospital for Consumption. The patient, a lad æt. 15, under the care of Dr. John Owen, Hon. Assistant Physician to the hospital, had been ill for one year. He had attended the hospital at the beginning of his illness but not since, and when seen was greatly emaciated, the lungs showing complete consolidation of all lobes, bronchial breathing, with moist râles and rhonchi all over the chest. He returned a week later, and was still at his work—that of chemist's assistant. Two things were remarkable in this case: the mental attitude of absolute unconcerned cheerfulness, and the absence of dyspnœa, illustrating the small amount of pulmonary tissue compatible with life. The next day patient's brother came to the hospital for a death certificate. From his description death was due to syncope.

For cases such as these—virulent forms of pulmonary tuberculosis, running a course similar to that of chronic phthisis clinically, except for the destruction of life in a shorter time, and pathologically, barring the absence of fibrous tissue and attempts at repair—for such cases, not acute but rapid, which at present wander through the gamut of every classification, the writer suggests the advisability of a return to the simpler clinical nomenclature of Trousseau (5), who described these cases as "Rapid Phthisis." The dictum of the great clinician was as follows:—

"With the exception of the rapidity of its pace, this form of the disease, to which we apply the term rapid, presents the same symptoms during life, and the same anatomical lesions after death, as ordinary phthisis, the progress of which is generally chronic. It is the same disease as ordinary phthisis, though it generally runs its course with much more rapidity. There are also cases to which the term latent phthisis is given, because the symptoms remain obscure, and are masked by complications which are apt to lead us astray in our diagnosis. Nevertheless, whether the form be rapid or latent, regular or irregular, it is, I repeat, always the same disease. But acute, or galloping phthisis as it is more generally called, is not the same disease as ordinary phthisis."

If now we consider the abdomen, we find it presents a symptom-complex of tuberculous lesions, which complicate the pulmonary condition. Apart from the vomiting and stomachic pain after food (possibly also a sign of the disease in the lungs), the child has no symptoms referable to the abdomen, yet nevertheless there are physical signs from which definite conclusions can be drawn. The abdomen is enlarged, tympanitic, but not tender, constipation is followed by offensive diarrhœa, and on palpation a thickened mesentery can be made out across the upper part, although no actual glands can be felt. Considerable light is thrown on the situation by a consideration of the arrangement of the dilated superficial veins, which show the early "cave-porte" type of Gilbert and Villaret (1). According to these authors, if there be a compression of the inferior vena cava alone, as occurs at the beginning of some forms of tuberculous peritonitis, in limited abdominal tumours, and in hernias of the abdominal wall, the collateral circulation is always subumbilical and limited to the level of the iliac regions. As the disease spreads and the circulatory obstruction is increased, the dilated veins mount higher and invade the supra-umbilical region, as is seen in the case of those veins which dilate in the case of obstruction in the course of the portal vein. The result is the mixed "cave-porte" type of collateral circulation most frequently seen in tuberculous or cancerous peritonitis. From the veins then, in conjunction with the other signs, we may deduce the existence of a lesion in the mesentery and in the peritoneum of the lower part of the abdomen —tabes mesenterica and chronic tuberculous peritonitis. In view of this the temperature, which was taken twice daily for a week, is of considerable interest. No antifebrile or antipyretic drug was given, yet the temperature was subnormal, although the pulse remained persistently rapid. Considering the lesion in the lung, this is only to be explained by the nature of the abdominal condition, and according to Osler (6) subnormal temperatures are common in chronic tuberculous peritonitis, the curious thing being, however, that in this case an "abdominal" temperature should take precedence of the ordinary "pulmonary" temperature.

The condition of pulmonary hypertrophic osteo-arthropathy, originally noted by Bamberger (7), was first described by Marie and Souza-Leite (8) in 1889. It is unnecessary here to recall their description of the disease, as the case above recorded is in complete conformity with the classical signs. We were first advised of the very extreme rarity of this phenomenon in children by Dr. George A. Gibson, who kindly wrote us on the case, and a perusal of the French and English literature leads us to the further belief that not only is this the youngest recorded case of the disease, but also the first instance to be noted where it occurs in conjunction with rapid pulmonary tuberculosis.

The etiology and pathology of this condition are quite unknown. Thayer's (9) collection of fifty-five cases from the literature showed

—forty-three following pulmonary affections, three following heart disease, three following syphilis, two following chronic diarrhœa, one following spinal caries, and three from unknown causes. Arnold (10), Marie (2), and Thomson (11) have described the lesions as being due to hyperostosis, osteophytes being deposited on the surfaces of the bones in response to chronic irritation of the periosteum or the marrow by toxins in the blood, absorbed from the pulmonary disease. Thorburn (12) considers it to be a benign type of osseous and articular tuberculosis. Certain cases have been recorded by Batty Shaw and Higham Cooper (13), Florard (14), and Decloux and Lippman (15), where the most careful examination failed to discover any pulmonary lesion. In view of this, it is of interest to note that in 1902, before the Medical Society of the Paris Hospitals, Thoinot and Delamarre (16) showed a patient with classical deformities, in whom ordinary examination had suggested the absence of any abnormalities in the lungs, but where the X-rays revealed the presence of an opaque mass in the middle lobe of the right lung, which they suggest may have been a hydatid cyst. Béclère, who made the X-ray examination, said that in these rare cases where no lesion was found, the examination was probably at fault, and were X-rays used it was probable that a profound lesion would be discovered. Certain it is that a deep lesion may exist in either lung and defy diagnosis by ordinary methods.

Much experimental work is required on this subject, but it may be a demonstration will be forthcoming that this hyperosteitis is due to the stimulation of the osteophytes by the toxins of tubercle. Marcozzi (17) in a recent work on the actions of the toxins of the tubercle bacillus, which, if confirmed, will throw considerable light on the whole pathology of tuberculosis, has stated that he has observed inflammatory and hypertrophic phenomena of the cellular elements of the testicle entirely due to the stimulus of diluted toxins in the blood. If we grant the existence of toxins in the blood capable of producing inflammatory and hypertrophic phenomena, it is not strange that their influence should be most manifest in those situations where the blood flow is greatest. It is one of the paradoxes of physiology that the volume of blood in the capillaries is greater than that in the arteries, and if the capillary stream is slow, the parts supplied show the greater metabolism. The terminal phalanges are nourished by a circulation which is purely capillary, and whose action on the metabolism of these tissues is characterised by two facts—firstly, by the appearance of the primary ossification centres of the distal phalange in the upper extremity at the ninth week of fœtal life, in the lower extremity at the twelfth week, and which further have been shown by Lambertz (18) to be the first of the phalangeal centres to ossify; secondly, by the growth of the nail during life. Again, at the lower end of the femur, while growth is proceeding, the ossifying cartilage is supplied by capillaries from the perichrondrium, periosteum, and from the medullary arteries, being the largest and most vascular ossifying cartilage in the body. The hypothesis suggested here is *that in the presence of tuberculous toxins in the blood, capable in certain dilutions of inducing inflammatory phenomena, the osteophytes in those areas are stimulated to action by the amount of toxin with which they are brought into contact, through the large capillary blood supply, whereby there results an excessive and pathological formation of bone.*

Lastly, we may consider the nature of the infection—bovine or human. From the facies and the early history there is little doubt that this child was marked out for tubercle, nor is this supposition weakened by the absence of phthisis in the family, for it is probable that predisposition to disease may have its roots in deeper and more subtle disharmonies of heredity than actual disease in the parents. Looking back on the first two years of the patient's life, during which time he was fed at the breast, there is no evidence of any sign of tuberculosis. At the age of 3, however, after consuming for one year cow's milk and flesh, a tuberculous gland developed on the left side of the neck. In the south of Spain tuberculosis is extremely common among cows and tame cattle, the fighting bull being comparatively immune—a wild animal living in the "optimum pabulum" of existence; and further, there is no efficient inspection of meat or milk. Next, the lung became affected on the same side as the gland, and on the opposite side to that in which 90 per cent. of "pneumatogenous" tuberculous lesions commence. Here it may be remarked that we have seen two other cases where glands in the neck were followed by a pulmonary lesion in the corresponding apex. It is not certain when the abdominal disease appeared, but it seemingly is a chronic condition, and possibly the enlarged gland in the neck was secondary to it, and similar to the early enlargement of the supraclavicular gland seen in cancer of the stomach. The latest lesion in the subpectoral gland indicates that generalised secondary infection has now set in.

It is impossible to dogmatise on the nature of the infection one way or the other, but the absence of contact with phthisis, the age at which it commenced, and the history of its onset, although insufficient to demonstrate bovine infection, is more than enough to shake any reasonable belief in the proposition, which was never more than a pure assertion, that bovine tuberculosis is not transmitted to man.

We take pleasure in recording here our thanks to Dr. W. A. Mackay and to Dr. Ian Macdonald of the Clinique Mackay, Huelva, for having placed this case among others under our care.

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RÉSUMÉ OF SOME RECENT FOREIGN LITERATURE ON THE SURGERY OF THE PROSTATE.

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Surgical procedures which involve the prostate gland appear inevitably to lead to controversy. During the evolution of the modern operation of prostatectomy, various debatable matters have arisen, and the discussions which have been aroused have been carried on with scarcely less animation than were those which engaged lithotomists when "the battle of the gorget" was being fought in the early years of last century. If these discussions have not always been edifying, they have at least served the useful purpose of concentrating attention on certain essential aspects of the question. The anatomy of the gland, its physiological functions, and the rôle it plays in producing the symptoms of "prostatism," have all been studied afresh, and much valuable information has been elicited. The effects which follow the removal of the organ are now being observed, and in time will be more fully known. It cannot yet be claimed that the technique of the operation is perfect, but the procedure may at least be said to have passed beyond the experimental stage, and to have established itself as a rational, scientific surgical measure.

Comparatively few surgeons have had a sufficiently extensive personal experience of the various methods of performing the operation to enable them to appraise the true value of each, and the majority of published opinions are as yet only tentative.

From a series of recent papers and reports we have attempted to cull some of the current views on various aspects of the subject.

Diagnosis.—In the great majority of cases the clinical features are sufficiently characteristic to permit of a correct diagnosis being made, both as to the nature of the prostatic enlargement and its disposition. At the same time, it must be admitted that a certain number of cases occur, and the records of these are gradually accumulating, in which all the symptoms of "prostatism" are present without the gland being enlarged. On the contrary, the neck of the bladder is surrounded by a ring of condensed tissue which has undergone a fibroid change, and which interferes with the opening of the orifice during micturition. For this condition, if it be diagnosed before opening the bladder, the Bottini operation is the method of choice. It is being recognised also, as a result of extended experience in the operative treatment of enlarged prostate, that *cancer* is more common than is generally supposed. Kümmell ([1]), for example, met with nine cases of carcinoma in forty-one cases of prostatectomy performed by him at Marburg. Three of the patients died from the operation; the others were alive a year after the operation, and were able to empty the bladder without difficulty. Göbell ([1]), reporting the cases from Helferich's clinic at Kiel, refers to three cases in which prostatectomy was performed for malignant disease, and which were all fatal from pyelo-nephritis. Referring to this matter, de Quervain ([2]) points out that the possibility of cancer should be suggested when the urinary troubles have developed quickly and are making rapid progress. In this, as in other diagnositic difficulties, the value of the cystoscope is emphasised by de Quervain, Kümmell, Rumpel ([1]), and others. The last-named observer considers it dangerous to distend the bladder with air, on account of the risk of air-embolism.

Indications for Prostatectomy.—There seems to be a pretty general agreement that the operation of prostatectomy has justified the claims of its pioneers, and that the results which it yields are on the whole superior to those of other methods of treatment. Difference of opinion still exists as to the proper time to operate, and the particular symptoms which indicate that that time has arrived. Kümmell, Desnos ([3]), and others give the catheter a trial first; Rydygier ([1]) favours early operation. All are agreed that the occurrence of retention, necessitating frequent catheterisation with all its attendant dangers, is a clear indication. Some consider that great frequency of micturition, pain, and particularly hæmaturia, justify the operation even when there is not actual retention. Freudenberg ([4]) adds as an indication the occurrence of abscesses in the prostate, leading to ulceration which renders catheterisation difficult and painful. The social condition of the patient, his circumstances as regards work, opportunities for emptying the bladder naturally or by means of the catheter, the proximity of medical assistance in the event of complete retention suddenly supervening, and many other factors, must be considered in deciding this question. De Quervain, discussing the indications in more detail, says that there is no doubt that so long as the bladder is not infected, and the patient is able to empty it, even with some difficulty, the operation may be delayed. If, however, there is *incomplete retention with residual urine*, the risk of infection taking place warrants the operation as a preventive measure, even if it does not render it imperative. In *chronic incomplete retention with distension of the bladder*, that is to say, when the patient only gets rid of the overflow, the operation is formally indicated. In *acute complete retention* the question is more complicated: if the retention supervenes on a chronic incomplete retention, the operation is indicated, but if it occurs suddenly in a patient who has hitherto been able to empty the bladder fairly well, then catheterisation is capable of re-establishing the function of the vesical muscle, and the patient may remain for a long time free of further trouble. In the presence of complications, such as infection, hæmorrhage, or secondary calculi, the indications to operate are more clear.

It remains to be mentioned, however, that Rovsing of Copenhagen (1), whose opinion on matters of urinary surgery must always command attention, differs from the majority of his colleagues regarding the advisability of performing prostatectomy. He adopts a conservative attitude, on account of the risk of the operation in old and weakly patients. He has performed *vasectomy* in ninety cases without a death, and with sixty per cent. of cures, and he considers it an excellent procedure in early cases of diffuse soft hypertrophy. He has performed suprapubic cystostomy for purposes of drainage in fifty cases, without a general anæsthetic, and none of the cases have been fatal. In sixteen cases he has been driven to do prostatectomy (ten partial and six complete), the indications having been a suspicion of malignancy, dangerous hæmorrhage, or the impossibility of using the catheter on account of the shape and size of the intravesical enlargement. Hypertrophy of the prostate, he says, is an innocent malady so long as it does not cause retention, and this it does only in about sixteen per cent. of cases. In these it is to be regarded as a disease, and the main indication in treatment is to obviate this retention and its consequences. As this can be done without danger by vasectomy or cystostomy, Rovsing does not consider prostatectomy justified. When there is total retention of urine, he considers that it is sufficient, in the first instance, to perform suprapubic cystostomy without an anæsthetic, stitching the bladder wound tight round a Pezzer catheter. The cystitis can be rapidly cured by injections of silver nitrate; the functions of the kidneys quickly improve, as does also the general condition of the patient. When the patient has regained his strength, the question of removing the prostate can be discussed. In Rovsing's experience the patient is usually so well content with his condition, that he prefers to go on with the suprapubic fistula and to keep his prostate.

Freudenberg (4) is an advocate of *Bottini's galvano-cautery operation* in preference to prostatectomy. He has performed this operation in 152 cases, with a cure in eighty-four, considerable relief in forty-five, and failure in twelve. In eleven cases the operation was fatal. The majority of fatal cases occurred in his earlier series of operations, and he shows that with improved methods and increased experience the mortality has been reduced from 12 per cent. in this earlier series, to 3·8 per cent. in his last series of fifty cases. It is pointed out, however, that relapse occurred within a year in twenty-one of the cases, and the author admits that the operation is only adapted to the special urinary surgeon with wide experience of intravesical work. The chief advantage claimed for the procedure are: that the patient is willing to submit to it early, before secondary effects of infection have supervened; that it can be performed under local anæsthesia; that there is little risk of potency being lost; and that permanent incontinence seldom ensues. The operation is contra-indicated, in cases of globular or pedunculated middle lobe; when the condition of the bladder cannot be determined beforehand by cystoscopy or otherwise; in the presence of vesical calculi; and when there is pyrexia.

There is a more general agreement as to the CONTRA-INDICATIONS TO PROSTATECTOMY, and as summarised by Kümmell these are: a bad general condition of the patient, general arteriosclerosis, long-standing catheter life, diffuse bronchitis, loss of contractility of the bladder, and insufficiency of the kidneys when this cannot be overcome. This surgeon is one of the few who still rely upon kryoscopy of the blood as a guide to the sufficiency of the kidneys. Cathelin (5) includes among the contra-indications cancerous disease of the prostate, while Kümmell and several others advise the operation in this condition. Rumpel points out that those forms of enlargement which surround the urethra like a ring cannot be enucleated.

ANÆSTHESIA.—The majority of surgeons perform the operation under a general anæsthetic. Kümmell of recent years has almost entirely used spinal anæsthesia, and he considers this a marked advance, as it obviates the effects of a general anæsthetic on the heart and lungs, which he considers a great danger in old people. Schleisinger (1) and Göbell also advocate the use of spinal anæsthesia. Payr (1) has employed Schleich's local anæsthesia, using 50 c.c. of a 1 per cent. solution of eucaine.

ROUTE.—There seems to be little doubt that the suprapubic route is that most favoured by the majority of surgeons. The *perineal operation*, which has been developed and advocated chiefly by French, American, and Austrian surgeons, has still, however, some strong supporters. Cathelin, for example, thinks that in the large majority of cases this is the route of choice, as it obviates the risk of severe bleeding, and drainage can be more efficiently carried out. It is specially indicated, he thinks, in fat subjects, in very old and weakly persons, and in cases in which the urine is infected. Despite Freyer's records, and while he admits that the suprapubic operation can be easily and rapidly carried out, he holds that there is danger of alarming hæmorrhage taking place, that the drainage is very unsatisfactory, that the wound requires much greater care than the perineal, and that there is danger of infection of neighbouring parts, and of persistent fistula.

Rydygier performs the perineal operation in all cases, except when the middle lobe is specially involved; and Legueu (6) has recourse to it in all cases in which the gland is not much enlarged. Kümmell performs the perineal operation only in cases in which the enlargement of the prostate is mainly towards the rectum, and in very stout patients.

Voelcker (1), while he considers the perineal method the more correct anatomically and the less dangerous, finds the suprapubic the easier operation.

De Quervain, from a study of the literature of the subject, finds the general opinion to be that the perineal operation is difficult to perform, always attended with considerable bleeding, and very liable to be complicated by lesions of the rectum, followed by the formation of recto-vesical fistula. On these points Freudenberg agrees, and he adds that while the perineal operation seems to be attended with a lower mortality, it is less certain in its results. In the opinion of Kümmell, there is no difference between the two operations as regards mortality.

In two of his perineal cases Göbell has had to do a plastic operation to close the fistula. He thinks that fistula is more likely to persist after the perineal than after the suprapubic operation, on this point differing from Cathelin, who is of the opposite opinion.

In performing the perineal operation, Rydygier does not open the urethra. After exposing the prostate from the perineum by blunt dissection, he incises the capsule on one side, shells out the corresponding lobe, and then clips it away from the urethra.

The *suprapubic operation* numbers among its supporters Israel (1), who recommends it very strongly, even in fat subjects. Carlier and Helferich also prefer this route. Among the advantages claimed for this operation are: its safety and the shorter duration of the fistula (Göbell); the ease and rapidity with which it can be performed, the greater facility of removing the median lobe, and the less likelihood of overlooking calculi in the bladder (Schleisinger); the diminished risk of infection of the wound, and the good drainage afforded by the suprapubic opening (Pousson). Freudenberg thinks it specially useful in those cases in which there is some doubt as to the condition of affairs within the bladder, and when there are calculi present. Rovsing, when forced to perform prostatectomy, prefers the suprapubic route, but he qualifies his approval by the remark that "just as it is beautiful and easy, so also is it dangerous and treacherous."

Riedel (¹) draws attention to a danger of the suprapubic operation: no fewer than four of his patients died of pulmonary embolism, due to thrombosis of the prostatic plexus.

When there is marked infection of the bladder, de Quervain favours the *two-stage operation,* a suprapubic cystostomy being performed and the bladder drained and purified through this wound, and the prostate enucleated some time later when the septic element has been eliminated.

The *combined perineo-suprapubic operation* is very rarely called for, and is only indicated when the prostate is exceptionally large (Cathelin).

A *modification of the suprapubic operation,* which consists in a temporary total resection of the symphysis pubis, has been described by Wullstein of Hallé (¹).

The operation is specially indicated in diseases of the prostate, in fistulæ between the bladder and rectum, and in tumours of the bladder situated in the fundus or in the vicinity of the ureters.

The skin incision is made from a point a finger's breadth above the middle of Poupart's ligament on one side to the corresponding point on the other, is convex downwards, and passes close to the root of the penis, which is drawn downwards. The suspensory ligament is divided close to the root of the penis, the inguinal canal opened up by dividing the aponeurosis of the external oblique; the fascia transversalis immediately above the spine of the pubis and near the outer border of the rectus opened so as to admit the finger, which is passed in behind the symphysis and separates the bladder from it. Through the opening in the transversalis fascia a wire saw is passed around the symphysis just outside the root of the penis, the section passing upwards through the spine of the pubis on either side. The symphysis is then displaced upwards, leaving, however, a small portion at its lower border in continuity with the root of the penis and subpubic ligament, this portion being detached from the rest by means of a chisel.

This method gives very free access, the obturator vessels and the femoral vessels are not damaged, the obturator membrane is left intact, and no tendency to hernia remains; and, the lower part of the symphysis being left, the dorsal vessels and nerves of the penis are so completely preserved that there is no interference with the mechanism of erection.

This stage having been reached, the bladder is emptied of urine and then filled with air, moderately and very slowly, and this avoids infecting the wound with any bladder contents. In cutting into the bladder the incision is so made as to avoid the blood vessels, horizontally or obliquely, according to the situation. The finger of an assistant in the rectum projects that portion of the bladder which it is desired to deal with into the wound. To keep the bladder dry for the first two or three days, a catheter should be inserted in each ureter, and a small quantity of nitrate of silver solution may be injected once or twice a day. In addition a catheter should be tied in the bladder.

If the bladder wound is stitched by the Lembert method a fistula is very apt to arise, and it is self-evident that one invaginating suture on the top of another through the thickened unyielding walls stretches and renders inefficient the inner tier of sutures; and as there is no peritoneal covering in the extra-peritoneal portion, there is no layer which will easily unite. Wullstein proceeds, therefore, in this way: he makes a curved incision through the muscular coat, and raises this in the form of a flap, and, having dissected it up to its base, incises the mucous membrane. When the operation is complete, he closes the mucous membrane with two, or it may be even three, tiers of invaginating sutures, and then brings down the muscular flap on the top.

The symphysis is then replaced and fixed with two silver wire sutures, and its lower edge fixed with periosteal sutures. The suspensory ligament is stitched again, the opening in the abdominal wall closed up so far as the fascia transversalis and inguinal canals are concerned.

AFTER-TREATMENT.—It would appear from the papers here summarised, that the chief difficulty encountered by continental surgeons in the after-treatment of cases of prostatectomy—whether perineal or suprapubic—is the management of the drainage. The relative merits of the large rubber tube inserted through the suprapubic wound, the retained catheter, and the combination of these, are frequently discussed; and, while some surgeons favour one method and some another, no one seems to find any of them entirely satisfactory. That these difficulties can be almost completely overcome by employing Cathcart's adaptation of the Sprengel pump, or some other method of suction drainage, such as that suggested by Caird, does not seem to be appreciated, and no reference is made to such measures by any of the writers.

Schleisinger and Israel both recommend that the cavity left after removal of the prostate be packed with gauze before the drain is introduced, but the majority seem to consider this unnecessary. Göbell and some others irrigate the bladder several times a day through the catheters.

SEQUELÆ.—The persistence of a *fistula* has frequently been observed after both the perineal and the suprapubic operation, but it is not clear from the available evidence which operation is more liable to be followed by this troublesome complication. In two perineal cases Göbell closed the fistula by a plastic operation.

Incontinence, due to destruction of the vesical sphincter, has been met with by de Quervain, Desnos, and others. In some cases this was only temporary, the muscular fibres of the membranous urethra taking on the sphincteric action; in others it was permanent.

Stricture of the urethra developed after the perineal operation in three patients of Kümmell's. The stricture was situated in the membranous portion of the urethra, and, after it had been dilated by bougies, the patient was able to pass water in a full stream. Kümmell recommends that in all patients who have undergone prostatectomy bougies should be passed regularly for six months after the operation, to prevent the formation of stricture. De Quervain at one time made it a practice to pass bougies after the operation, but he now considers this precaution superfluous, and has omitted it in his recent cases. Rovsing has met with stricture after two of his suprapubic and one of his perineal cases. In the last, stones formed in the cavity left by the operation.

Loss of the genital functions has been urged as a strong objection to the operation of prostatectomy by its opponents, and especially by those who advocate the Bottini procedure, and the possibility of its occurrence is admitted even by its strongest supporters. Desnos considers it a somewhat common sequela, especially after the perineal operation, in which the removal of the terminal portion of the vasa deferentia renders erection impossible. Freudenberg also looks upon impotence as a certain sequel to a complete perineal operation. He reports, however, the conservation of sexual power in some cases, and in one even after vasectomy had previously been done. De Quervain states that potency was lost in all the five cases operated on by him, in which it was present before the operation. Legueu is of opinion, and in this he agrees with most observers, that the suprapubic operation is less liable to be followed by loss of sexual power than the perineal.

The deleterious effect of the loss of the prostate on the *mental condition* of the patient is emphasised by Rovsing, who refers to several cases of suicide following the operation. He thinks that there is a direct connection between the prostatectomy and the mental disturbance, and he supports this view by pointing out that inflammatory destruction of the prostate gland tissue by gonorrhœa, tuberculosis, or suppuration, is also liable to be followed by similar mental deterioration. One of Voelcker's patients committed suicide some time after the operation; and Rumpel has observed psychical disturbances and melancholia after removal of the prostate, and two of his patients subsequently committed suicide. De Quervain, on the contrary, has seen no such effects; rather have his patients improved in their moral tone and "rejoiced in their rejuvenescence." The fact that the cases quoted by Rovsing and others constitute rare exceptions in the great number of patients submitted to the operation of prostatectomy, seems to him to prove that the loss of the hypothetical internal secretion of the gland does not exercise any unfavourable effect either on the physical or the mental condition of the individual.

Results.—There is no room for doubt as to the beneficial results of prostatectomy in those who survive the operation and escape the complications which have been referred to above. All are agreed that the patient is relieved of a burden which is well-nigh unbearable, and enters upon a new lease of life with restored health and renewed vigour. The benefits derived from the operation are so great, and are shared in by such a large proportion of those operated upon, that the sufferers from this disease are amply justified in running considerable risks to obtain them. What the risk exactly amounts to is difficult to determine. The statistics of individual operators with regard to the mortality of the operation vary greatly, and combined statistics are apt to be misleading. Thus we find that in 586 operations, performed by seventy-one surgeons, tabulated by Legueu, the mortality was 13 per cent.; but if the cases recorded by Freyer are excluded from this list the percentage rises to 17. The last statistics of Freyer show a mortality of only 3 per cent., while his combined records represent 7 per cent. (De Quervain). The results brought before the Congress of German Surgeons this year by different operators show a mortality varying from 10 to 30 per cent. While we are free to admit that the material is not reported in a form which enables us to arrive at a reliable estimate of the value of the operation from these figures alone, we cannot avoid the feeling that the results are much less satisfactory than those obtained by British and American surgeons.

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REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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The Operations of Surgery. By W. H. A. Jacobson and R. P. Rowlands. Fifth Edition. 2 Vols. London: J. & A. Churchill.

In the present edition of this well-known work, which extends to two volumes, each of over 900 pages, the talented and much respected author has had the assistance of Mr. Rowlands in the articles dealing with the abdomen, and of Mr. Bellingham Smith in those dealing with the ovary and uterus. In spite of its gigantic size, it is still declared to be intended not for those with a large surgical experience, but for those who are recently appointed on a hospital staff and those preparing for the higher examinations. It is undoubtedly an excellent book for any one who has begun to specialise in surgery, because the opinions of different authorities are given, usually in their own words, at any rate on all controversial subjects. It might almost be said that Mr. Jacobson has gone out of his way to do justice to the work of others, for the latter is often represented by so many quotations that the reader runs the risk of being embarrassed in his choice of procedure. It might also be said that the thoroughness with which every operative detail is discussed would almost prevent any one consulting the work unless he had a good deal of time to spare.

We cordially approve of the author's retaining the division of the subject matter into regions, the intention being that those for whom the book is intended should study the anatomy of each region at the same time as the account of the operations; but surely in the teaching of operative surgery there are subjects which have to be considered from the general point of view; we might instance anæsthetics and wound technique. It certainly appears a little old-fashioned to find under the description of individual operations that "the skin should be disinfected two days before," and other details of a similar character. The arrangement offers also a fair field for criticism, when, under the heading of "the upper extremity," it is found necessary to discuss the whole question of the surgery of tendons in relation to the operative treatment of paralyses, and the author is obliged to take his examples and his illustrations for the most part from the lower extremity.

We have looked through this edition very carefully, and can testify to the enormous amount of information which it contains. Some of the new illustrations, especially those borrowed from the writings of American surgeons, are a decided improvement on those which are retained from former editions.

In concluding this notice, we feel that we have not given Mr. Jacobson and his colleagues sufficient credit for having produced a work of such intrinsic merit, and one in which the writings of surgeons in this country receive a larger measure of recognition than in any other with which we are acquainted.

Gynæcology and Abdominal Surgery. By **Howard A. Kelly** and **C. P. Noble.** Vol. I. London: W. B. Saunders Co.

Kelly and Noble's "Gynæcology and Abdominal Surgery," of which the first volume has been published, will well repay a careful perusal, and will occupy a unique place as a book of reference. In these days it seems to be the fashion to produce works by a congeries of authors, rather than to produce a continuous record of the study and experience of a single individual. Veit, Allbutt, Osler are but a few illustrations of this. Certainly this system has the advantage of presenting a definite monograph by a specialist on each particular subject; but it would be extremely difficult to say upon what subject in gynæcology or abdominal surgery Kelly and Noble are not recognised experts. At the same time such a book lacks that harmonious continuity and evenness of style which are characteristic of a book produced by one man, or even by the collaboration of two.

At the present moment, when the ordinary surgeons seem to be ignoring or ignorant of the fact, it is well that they should be reminded that to gynæcology they owe the triumphs of abdominal surgery, and it is satisfactory to notice that in their introduction the editors press this matter home.

One special feature common to all the articles in this volume is their extreme conciseness and lucidity; there is no overlapping or repetition anywhere, and this conciseness is not achieved by lack of completeness in the work undertaken. The article on "Gynæcological Pathology" is a most excellent example of this feature. The description, for instance, of the various degenerations of fibroids is quite brief but sufficiently exhaustive. Considering the amount of attention which has recently been drawn to the subject, and the mass of literature which has accumulated about it, the description of chorio-epithelioma is somewhat disappointing.

It is agreeable to find a place given to "Medical Gynæcology," a chapter which has been rendered with all the accuracy, clearness, and experience of Dr. Noble.

His introduction is particularly reassuring:

"To value operative treatment only in gynæcology is an error, which perhaps has been frequently made in recent years. On general principles, operative treatment should never be selected when non-operative measures will give results equally as good. The selection of operative or of non-operative measures in a given case depends upon the nature of the condition and upon the social position of the patient. In many gynæcologic diseases nothing but operation can be considered. In others, the patient may be allowed to choose between the non-operative and the operative plan of treatment. The choice will sometimes depend upon the amount of time at her disposal."

Dr. Noble includes in his medical gynæcology a very careful description of displacements and their treatment. Such scarcely fall under this heading, but he explains that his chapter is mainly intended for general practitioners to whom the performance of such work frequently falls—and a most excellent chapter it is.

In the article on "Inoperable Cancer" there is included an important communication from Dr. Pancoast on the use of the X-rays in its treatment. In reference to this the following is worth quotation:—

"With no pretence at conservatism, it may be stated that without exception the X-rays treatment of carcinoma of the uterus and the appendages is to be used only in inoperable cases, or as a post-operative prophylactic measure; in either application it has a range of usefulness of sufficient merit to give it recognition as one of the methods to be frequently employed in the treatment of carcinoma. While it does not accomplish nearly all that has been claimed, it is to be hoped and expected that future study and experience and further improvement in technique and apparatus will lessen the uncertainty of the desired results."

America has always been the home of vesico-vaginal fistula. The original pioneers in this work were Marion Sims and Emmett, and it has been left to Kelly to crown their work by his magnificent researches on the urinary tract. The article before us on fistula is one of the best in the book. There is little left on this subject which one desires to know, that is not comprised in Kelly's twelve concise pages.

Clarence Webster deals with the subject of the removal of the uterine appendages in a thoroughly masterly manner. Beginning with a terse historical survey, he gives a very excellent résumé of the conditions in which the operation should be undertaken; and besides the other more common conditions, he discusses the question of the removal of the ovaries in osteomalacia, distant carcinoma, and in certain mental and nervous disorders, and in conditions of the genital tract—such as the atresias. With regard to the operation, beyond remarking on the excellence of the illustrations, there is nothing to be said. He might have been a little more explicit in the description of the vaginal route.

Concerning the removal of the ovaries for inflammatory conditions, Webster's remarks are well worthy of quotation:

"It is indeed only now that gynæcologists are finding out that the necessity for performing oöphorectomy in inflammatory conditions is comparatively rare, the conservative procedure of freeing the ovary from adhesions, incisions, ignipuncture, and resection taking its place in a large number of cases. The recognition of the part that the neurotic element plays in giving prominence to pelvic pains in women has been an important factor in modifying operative treatment."

Noble's chapter on "Hysteromyomectomy" is one of the most complete in the volume, and it is enriched by a very complete bibliography; it embodies in brief the author's exhaustive article, published last year, on the degenerations and complications of fibroid tumours. It gives a very interesting account of the evolution of the operation of hysterectomy for fibroid. The paragraphs on the indications for operation are extremely full and suggestive. He has collected over 2000 consecutive cases, and his deduction is a very striking one: that "in only one-third of the cases of fibroid tumour as seen in the operating-room, does the disease exist in an uncomplicated condition; 30 per cent. of women having fibroid tumours would die without operation in the natural course of the disease and its complications." The author's own opinion clearly indicates the trend of surgical opinion of the present day, which is that fibroid tumours which produce symptoms, or which are growing, should be removed. Noble's words are:

"It is the opinion of the author that fibroid tumours should be removed for the same reason that ovarian tumours are removed, the indications differing in degree but not in kind. The early removal of ovarian tumours is practised to guard the patient against the known risks of delay in these growths. The same rule should be applied to fibroid tumours. The nature of the indication is quite similar to that for operation for parovarian cyst, hydrosalpinx, salpingitis in its quiescent stage, Graafian follicle cyst, corpus luteum cyst, or the removal of the vermiform appendix in the interval between attacks of appendicitis. A fibroid tumour is more dangerous to life than any of these morbid conditions. The general rule in surgery, that tumours should be removed, is just as applicable in other regions; and this rule of practice should be based upon the life-history of the tumour rather than upon the particular symptoms which are present when the patient comes under observation. Maurice Richardson states an important truth when he says, 'Whenever we postpone operation on fibroid tumours, no matter how benign these tumours may seem, we are running a risk beside which the dangers of an operation are but trivial.'"

The section devoted to the operation is very complete, and the various points in technique are described with a wealth of detail which makes the article specially valuable.

The operations of myomectomy and hysteromyomectomy are compared, and the former practically relegated to cases of pedunculated subperitoneal or pedunculated submucous tumours. The actual operations are clearly described and well illustrated. An urgent and needful plea is made for the careful examination of the uterus, adnexa, and tumour after removal—both in order that one may recognise any malignancy and guard the patient against possible recurrence, and in order that our knowledge of this condition may be increased by the accumulation of facts regarding it.

Radical abdominal hysterectomy for cancer of the uterus is dealt with by Dr. John G. Clark. He summarises the development of the operation up to the present day, and concludes that "the tendency will not be to a further extension of the radical operation." Indeed, he goes further and condemns such extensive operations as Wertheim's in most cases.

Henrotin describes vaginal hysterectomy, and gives an interesting and exhaustive historical sketch of this procedure.

Kelly's article on "Conservative Operations on the Ovaries and Tubes" is characterised by his usual thoroughness. He gives a lucid account of the method of dealing with ovaries so as to save the tissue; and he gives a most complete list of the various conservative operations in gynæcology at present recognised. One is lost in admiration of the exquisite drawings which specially adorn this chapter.

All the articles are well worth perusal, but the limits of a review will not admit of a lengthened reference to each. The whole production of the book—illustrations and letterpress—reflects great credit on the publishers. It is a pleasure to anticipate another such volume.

An Introduction to Child Study. By W. B. Drummond, M.B., F.R.C.P.Ed. London: Edward Arnold.

Child study, though one of the youngest sciences, grows so rapidly, and has developed so extensive a literature, as to make it difficult for those who are not experts to keep pace with its progress. Such a thoroughly good and comprehensive introductory treatise as this, from the pen of an authority like Dr. Drummond, will therefore prove a boon to the ever-growing number of those approaching the subject for the first time. Many people, neither superior nor old-fashioned, look somewhat askance at child study, and it cannot be denied that some of its ephemeral literature is both trivial and inconclusive. It is the great merit of Dr. Drummond's book, that it takes a broad survey of the route which the science pursues, and shows the unity of its aim amidst the diversity of its methods. It would be easy to extract sentences which justify the study of children by appeal to many instincts; we select one which appeals to reason. "The spontaneous activities of children are governed neither by desire for pleasure, nor by fear of pain, but by impulses from within which prompt to action without foresight of results. . . . In such impulses, as they arise, we find the opportunity and hope of the educator." This, in short, is the aim of child study: how best to bring up children so that they may be happy, useful men and women.

The subject matter of the book is very various, but may be roughly divided into four sections. First, we have a discussion of the preparation for and methods of child study; next, an account of bodily development; next comes mental growth; and finally, the moral and religious development. In speaking of the preparation, Dr. Drummond rightly emphasises the need for a training in some branch of science. Apart from its particular application, this chapter is well fitted to remove many popular misconceptions as to what the scientific temper means. Children have been studied by biologists, educationalists, and psychologists, and these methods accordingly fall to be considered, but perhaps the chapter which will be read with most wide interest is that containing the schedule for studying a baby. In this syllabus Henry Drummond's classified list of the emotions, in the order of their development, is quoted from "The Ascent of Man." We greatly doubt whether this order is even approximately accurate, and should have preferred a table drawn up by the author himself. Otherwise the syllabus is admirable. The chapter on fatigue contains references to Mosso's work, and is particularly worthy the study of teachers. In discussing instinct, Dr. Drummond quotes some very remarkable recent researches, tending to show that animal instincts are less stereotyped, and therefore approximate more closely to the impulses of children, than is commonly believed. As the result of an investigation of the interests of Edinburgh school children, the author has confirmed Earl Barnes' observation that younger children are principally interested in the use and action of objects; older children in their substance and form. This gives an obvious hint as to the direction object-lessons should take. The play of children is of great interest from many points of view; we agree that the "preparatory" and "recapitulatory" theories are not mutually exclusive. Groos's theory, we have always thought, is prejudiced by its name. Boys play at soldiers, and girls with dolls, and thus gratify instincts analogous to those of their fathers and mothers. To call this "preparatory" is true enough in a sense, but it is difficult not to read into the word a teleological implication better avoided. On the other hand, much of the play of children is certainly traditional, and carries with it hints and reminiscences of ancient rites and primitive customs. Many readers will turn with special anticipation to the chapter on religion and children. It is full of evidence of careful thought, and is so sympathetically written as to be incapable of offending any susceptibilities. The idea of applying the culture-epoch theory of religion to the requirements of children at different ages, seems to us singularly fruitful and suggestive, and we feel that we have learned much from Dr. Drummond's thoughtful pages.

Dr. Drummond is so well known as an authority on child study that it is not necessary to say more in praise of the contents of this volume. It is not only a most useful and instructive, but a very charming and scholarly work, the mere reading of which gives pleasure, apart from its more solid merits. The author is especially to be congratulated on his selection of quotations for the chapter headings; they are without a single exception extraordinarily appropriate, and really adorn the book. It cannot fail to achieve the great popularity it merits.

On Treatment. By Harry Campbell, M.D., F.R.C.P. London: Baillière, Tindall, & Cox.

As those familiar with other of Dr. Campbell's writings might expect, this volume, on treatment, is refreshingly original, and differs wholly from the ordinary text-book of therapeutics. Since the prevention and cure of disease is the sole justification the physician has to offer for his existence, Dr. Campbell begins by considering how he had best be trained to that end, and it is undeniable that there is much justice in many of the criticisms he passes on the present-day teaching of medical students. There is no doubt, for instance, that the collection, classification, and memorising of symptoms tends to become an end rather than a means; but is there not this to be said for the "ultra-symptomatologist"—that as time goes on he is able to identify fresh groupings of symptoms, and that, after all, to recognise a new disease is the first step to its cure? In one of his essays on education, Huxley remarks that the great end of life is not knowledge but action, and that success in every kind of practical life is not dependent solely, or even chiefly, on knowledge; the same notion seems to run through a great deal of Dr. Campbell's writing. His first dozen chapters deal with such topics as the physician's personality, his relations to patients and colleagues, to quackery, humbug, fads, and systems of treatment,—all of which are discussed in a common-sense vein, and without the intrusion of everyday platitudes. The second half of the volume is more directly concerned with actual treatment, or perhaps we should say with the maintenance of personal hygiene. Among the topics considered are fresh air, clothing, exercise, and, in particular, diet. Dr. Campbell approaches the question of food from the evolutionary standpoint; he has obviously bestowed much thought on the evolution of man's food habits, and has gathered together a great deal of interesting evidence bearing on the subject. His views on mastication appear to us thoroughly sound and worthy of due consideration. The book is not, as we have said, a treatise on the management of individual diseases, which are only now and then alluded to, chiefly in the form of actual case histories; it is a thoughtful essay on healthy living, and how the physician can best enforce its laws on his patients. The author is an original and forcible writer, and his book is one which anybody may read with pleasure, and from which nearly every one, according to his temperament, will learn something useful.

A Text-book of the Science and Art of Obstetrics. By HENRY J. GARRIGUES, A.M., M.D. Second Edition. London: J. B. Lippincott Company.

ONE cannot read this, the second, edition without being impressed by the fact that the whole work has been thoroughly revised and brought up to date. It was pointed out with regard to the first edition, that the author had erred somewhat in neglecting the work of others on important subjects. This volume also bears the stamp of the author's personal observation and experience, but in discussing the more debatable subjects, such as eclampsia, Cæsarean section, and hebotomy, fuller reference is made to the abundant recent literature. The work is, however, by no means burdened by a record of varying opinions, and still preserves the character claimed for it by the author—that of text-book, and not a work of reference.

One is amused to read that, in the conduct of normal labour when no trained nurse is available, Dr. Garrigues insists on the presence of the husband in the room. He says the least the author of her trouble can do is to witness her sufferings. "Woe to those thin-blooded, pale-faced, selfish men who declare they cannot see blood, and who keep away from home, or retire to another room, in order not to hear the cries of their wives in labour. They are unworthy of a woman's love"! With that we cannot agree, and would with pleasure never see the husband till we congratulate him on the birth.

Turning from sentimental to more practical points, one notes that the author always expresses the placenta by compressing the uterus by both hands. In the majority of cases we find one hand, as recommended by Credé, sufficient, but there is no doubt that the method described succeeds occasionally when the other fails, and this is not sufficiently emphasised in most English text-books. Dr. Garrigues has not used medullary cocainisation in labour, and does not intend to do so. Like most obstetricians, he finds chloroform the ideal anæsthetic in midwifery. One is surprised to find tapping of ovarian cysts during pregnancy recommended, so as to defer ovariotomy till after the puerperium. This view will not be endorsed by British obstetricians. The author still believes that the use of electricity to destroy an extra-uterine fœtus does not deserve absolute condemnation, if the method is practised early.

In view of recent discussion, it is interesting to note that Dr. Garrigues approves of compression of the aorta in the treatment of post-partum hæmorrhage. It diminishes the blood supply to the uterus by one-half, but he adopts all the other usual methods at the same time. It seems to us that he does not make sufficient distinction between hæmorrhage during the third stage and true post-partum. The value of artificial expression of the fœtus is discussed: it is said to be of especial value when the retraction ring has receded high up. One cannot understand this, as it is just in those cases that one would fear rupture from expression. Dührssen's deep cervical incisions are not recommended, and the author prefers dilatation of the os uteri to vaginal Cæsarean section, which he would limit to those cases where the cervix is undilatable. The operation of hebotomy is described in detail, and its great advantages over symphyseotomy are fully discussed.

The chapter on puerperal infection is the best we have read on the subject. Every possible septic complication is described, and the appropriate remedy suggested. The author has no faith in antistreptococcic serum nor in hysterectomy for sepsis. Towards the end of the work there are several most useful chapters on minor ailments of the puerpera and of the new-born child.

This text-book on obstetrics is a most reliable and readable one. The details of treatment alone—a strong feature of the work—will commend the book to student and practitioner alike, and we feel confident that it will take its place among the foremost of the many excellent works on obstetrics that now are published.

The Principles and Practice of Dermatology. By WILLIAM ALLEN PUSEY, A.M., M.D. London: Sidney Appleton & Co.

THERE are two methods by which the date of a progressive science are recorded. In one, the author issues at intervals amended editions of his treatise, incorporating with the previous statements notices of fresh advances. But there is a limit to revision, partly because the introduced matter fails in time to harmonise well with the old, excision and remodelling being deficient, and partly because the writer finds increasing difficulty in keeping himself thoroughly abreast of the forward movement. This is intensified should the duty of recasting be entrusted to another hand, since then the patching becomes ever more and more conspicuous. Hence the other plan is necessary which consists in successive minds taking up the subject. In this way something of the old may be lost, but the growth of knowledge is better exhibited. We hail, therefore, this most recent exponent of dermatology, especially since he proves himself competent both in acquaintance with his material and in capacity for lucidly expounding it. One-sixth is devoted to the principles and the remainder to the practice. He makes a good impression at the outset by the way in which he treats the anatomy, physiology, and pathology of the skin. This is thoroughly up to date, and the details are so clearly laid down and so judiciously and fully illustrated, that the picture conveyed on perusal is accurate and withal simple. Much the same may be said as to the principles of treatment. Here perhaps the newer methods are even better presented than the older. We have not read anywhere a fairer, if brief, description of opsonins and serum medication, or a more concise account of the mode of action of and the indications for Röntgen therapy, than is here given. While we do not wholly agree with Pusey in his averments as to some of the time-honoured remedies and their employment, on the whole there is very little of importance omitted, and less to take exception to. Classification of skin diseases is a thorny topic, and the time has not yet arrived for a wholly satisfactory one. "The best that can be done in the present state of our knowledge is to group them as far as possible upon the basis of their resemblance in essential features." That adopted is Hebra's slightly modified.

Passing to the practice, we turn almost involuntarily to eczema as the touchstone whereby to test the merits of the work. Apparently the view as to its nature which commends itself to Pusey is, that this is best determined by considering what it is not. "The eruption of eczema is the same as that of dermatitis, and as the only essential feature of eczema is its eruption, we are forced to the definition that the term eczema connotes various forms of simple dermatitis." And again, "According to this conception, eczema is not a substantive disease, it is not a distinct pathological entity; it is rather a group of symptoms in the skin which can be produced by innumerable causes. And this is the fact." There is no doubt whatever that this idea of eczema is the one most easily grasped, and therefore for all practical purposes the best. It does not include all forms of inflammation in the skin, but we can pretty readily exclude such as are certainly not eczema. To the popular mind eczema is a term imbued with undefined dread. Why it is so is not by any means clear, but the sense of relief expressed by patients when told that the ailment for which they are seeking advice is not eczema is patent to every one in their altered aspect, if not manifested by words. Eczema seems to occupy the parallel place in the medical sphere as the Apocrypha does in the theocratic. The profession in general are in doubt what is eczema, and treat it hesitatingly; as we have seen the public are afraid of it. The Apocrypha is looked at askance as a mysterious portion of Scripture of dubious validity by the clergy; it is avoided as uncanny by those of the laity who have seen it. This is not the way, however, in which eczema is handled by Pusey. His account of it [is clear, terse, and convincing. He says enough, yet does not burden his reader with useless or redundant details. The student will find the section an instructive one, though possibly he may not be able to follow all it covers; to the general practitioner it will prove of superlative value; and even the specialist will discover in it suggestions of utility. We do not say that by a perusal of it the ordinary practitioner will learn how to cure every case of this disease which comes under his care,—Pusey himself does not claim this,—but he will certainly rise from its study better qualified to manage an example of eczema than he was before. And what applies to eczema applies to the entire work, which we have dipped into freely, and read a large part. Its author is singularly well qualified for composing such a treatise. He has set himself to its production after careful examination and assimilation of the contributions of others, while he has amalgamated with this much material drawn from his personal observation, and so has constructed a manual which is a credit to himself and a distinct gain to dermatology in general. We must not close this notice without adverting to the numerous illustrations, which, though in black and white, in most cases provide an admirable representation of the diseased condition. It is a pity that in so doing the weight of the book is much enhanced; in that sense it is hardly a manual, since it needs to be placed on a sloping surface for comfortable consideration.

Handbuch der Geburtshülfe. In drei Bänden, herausgegeben von F. von WINCKEL. Dritte Band, I. Theil. Wiesbaden: J. F. Bergmann.

THIS encyclopedic work, edited by Professor von Winckel, resembles in its comprehensiveness Veit's "Handbuch der Gynæcologie," published eight years ago. The first part of the third volume deals with obstetric operations. The description of each operation is prefixed with a most copious bibliography. As showing the enormous industry which has been displayed in this department, it may be mentioned that the list relating to the induction of premature labour occupies nearly thirty pages. A history of each operation is given, followed by the indications for and modes of performance. The operation of symphyseotomy and the more modern hebotomy are described by Kroenig, who does not put sufficient importance on the subcutaneous method of performing the former operation. He leaves the reader uncertain as to whether symphyseotomy or Cæsarean section is preferable, and puts the maternal mortality as being about the same in both (10 per cent.). The article on Vaginal Cæsarean Section is written by Dührssen of Berlin. He has collected 248 cases, with a mortality of 13·3 per cent. He believes it to be the best method of delivery in certain cases of eclampsia. The classical Cæsarean section, written by Kleinhans, is most excellent. The chapter dealing with the induction of premature labour is illustrated with twelve diagrams. The indications are very fully gone into, and the writer concludes that although we have not an ideal method suitable for all cases, Krause's, preceded by hot douches, is the best. Valuable statistics are given of the maternal and fœtal results in cases of contracted pelvis, and also details regarding the later conditions of children so delivered. Wyder believes that dilators of the Bossi type have a useful place in operative obstetrics, where rapid delivery is urgently called for, as in cases of eclampsia and accidental hæmorrhage. When dealing with version, Sarwey discusses very fully the pros and cons as to which foot to grasp, and recommends that for beginners the lowest and nearest should be chosen, irrespective of the position of the fœtus. The method of Braxton Hicks is contributed by the editor, and contains an interesting chapter on the value put on this operation in different countries. Kroenig prefers perforators of the scissor type, and although reference is made to Simpson's basilysis in the bibliography on craniotomy, yet no notice of it appears in the text. The high forceps operation is not enthusiastically recommended, although the advantages of axis traction are admitted, preference being given to the forceps constructed by Breuss, in which traction is made on the handles, the rods acting as indicators. In writing on manual separation of the placenta, Strassman rightly insists on the avoidance of the use of all instruments, such as the curette, and points out the frequency with which the wall of the puerperal uterus is "butterweich." For douching after removal of the placenta, the dangers of alcohol, carbolic, and sublimate are pointed out, preference being given to sterilised water. Plugging the uterus with gauze is recommended when bleeding continues.

In marked contrast to many modern works on obstetrics, this volume is very scantily illustrated. The bibliographies, however, are more thorough than in any other obstetric work which has ever been published. Taken in conjunction with the other volumes, this work deserves a foremost place in obstetric literature. It will remain a permanent monument to the great industry and enterprise of its editor —one of Germany's greatest obstetricians.

The Johns Hopkins Hospital Reports. Vol. XIII. "Studies in Urological Surgery." Vol. XIV. "Studies on Hypertrophy and Cancer of the Prostate." Baltimore: The Johns Hopkins Press.

The two volumes of the *Johns Hopkins Hospital Reports* recently issued are entirely devoted to genito-urinary surgery, and maintain the high standard characteristic of work done in that school. Associate Professor Hugh H. Young, along with his collaborateurs, Doctors Fowks, Churchman, Lehr, Geraghty, Stevens, and Remsen, give in vol. xiii. a series of papers of varying importance, but each paper is valuable and adds to our knowledge of the subject with which it deals. All are educative and go towards the elucidation of a difficult subject—genito-urinary surgery. Stricture of the urethra is discussed by Professor Young, who reports 400 cases in considerable detail. He discountenances *divulsion* and *internal* urethrotomy, and strongly advises, in those cases, in which a filiform bougie can be passed, *dilatation*, which he says is the "foundation-stone in the treatment and cure of stricture." It should be slow and gradual, and should be continued until 30° F. calibre is reached. He believes *external* urethrotomy a most valuable procedure in impermeable stricture. In seventy-nine of the 400 cases this was adopted, and in thirty, which could be traced, eighteen showed no sign of recurrence. This paper is a valuable résumé of the treatment of stricture, and corresponds very closely to the views of Edinburgh surgeons. It is perhaps justifiable to quote the author further when he says, "At the thirteenth International Medical Congress held in Paris in 1903, the death-knell of internal urethrotomy (as a common procedure) was sounded, and the lasting curative value of dilatation, and its necessity for protracted periods, after all other methods, was unanimously accepted." Nogue's report of 132 cases of internal urethrotomy, "sixty-eight of whom had continued to dilate themselves and were cured, and the sixty-four others, having abandoned all treatment, had recurred," was most convincing as to the efficacy of *internal* urethrotomy *per se.*

In a separate paper Professor Young alludes to impermeable stricture, and advocates perineal retrograde catheterisation in preference to retrograde catheterisation through a suprapubic cystotomy.

Dr. Churchman, from experimental work, believes urotropine more efficacious in bacteriuria than salol, and advocates its use as a preventive prior to instrumentation, as it inhibits organismal growth. He believes it to be valuable, as a curative measure, in cases of bacteriuria, more especially in those cases where there is no cystitis. Others of the papers, *e.g.*, cystoscopy in the diagnosis of diseases of the prostate, and chronic prostatitis, are elaborate and instructive, but space does not permit of more than their mention.

Vol. xiv. is wholly given up to an account of prostatic enlargement and carcinoma of the prostate. It is of much interest at the present time, when the battle of the routes is being debated, as in it Professor Young relates in detail his operations by the perineal route for enlarged prostate. His cases number 185, with a mortality of seven, *i.e.* 3·7 per cent. His last sixty consecutive patients have all recovered. The method he uses is, in effect, that of Proust and Albarran, although he makes a great point of trying to preserve the ejaculatory ducts, and it is perhaps unfortunate that he does not give these pioneers more credit for the valuable work they have done. The reliability and success of the method, in Professor Young's hands, is amply shown by the statistics quoted. To the general consideration of the subject, with his personal experience, he devotes 140 pages, and then reports in minute detail 145 cases; this latter portion occupying 330 pages of small type.

An accident occasionally seen in perineal operations is the formation of a recto-urethral fistula, and in 163 cases this has occurred in seven. He believes the risk of this is much diminished by restoring the support of the levator ani muscles by approximating these muscles with a single catgut suture. Should it occur, he believes, it can be easily cured by supplying suprapubic drainage at the time when repair of the fistula is carried out.

The last 130 pages of this volume are devoted to a consideration of "the early diagnosis and radical cure of carcinoma of the prostate." The subject of operation in this condition is still *sub judice*. Many patients only consult a surgeon when it is too late to attempt more than palliative measures, but even in earlier and more favourable cases to excise the disease means a serious operation, which must interfere with the sphincteric region of the bladder. The author reports four cases in which he operated, but the results are far from encouraging. The first died in nine months, and the second in two. The third and fourth were alive at the end of a year, but each had incontinence. In all, the period has been too short to say that recurrence will not take place, and permanent incontinence is a most disabling and unpleasant result. How long and in what degree of comfort would the patients have lived with delay in operation until symptoms arose which necessitated palliative operations?

These two volumes are worthy of the school from which they emanate, and are a magnificent testimony to the indefatigable industry of Professor Young and his coadjutors. They will be most useful for reference, and may be taken as models of how case reports should be done.

The Re-education of Co-ordination by Movements, with Special Reference to Locomotor Ataxy, accompanied by Mounted Charts for the Movement Exercises. By Arthur G. Dampier-Bennett, M.R.C.S., L.R.C.P., Kingstown, Co. Dublin. Bristol: J. Wright & Co.

In this little pamphlet, for it can scarcely be called a book, the author gives a short and very sketchy account of the principles underlying the treatment referred to in the title. He describes a series of movements which "differ sufficiently from the movements practised by Fraenkel to constitute a distinct method of treatment, though undoubtedly in the same class." The author, it would seem, fails to understand that it is to the principle of treatment, and not to any special series of individual movements, that the name of Fraenkel, which name is spelt without an a, is applied. The statement that "these movements are nevertheless unsuited for use in general practice" is somewhat ambiguous, but if thereby the author intends to imply that the general practitioner is unable to carry out the treatment with any degree of success, the reviewer's experience justifies him in expressing a contrary opinion, for he has seen very satisfactory results in cases treated by general practitioners, who had thoroughly grasped the principle of the method and persevered in its application. It is somewhat unfortunate that the author has not confined his remarks to the re-education of co-ordination by movements, for assertions to the effect that "if the mental symptoms are causing anxiety, Turkish baths are of value; but the purely ataxic symptoms can best be treated by means of carbonic acid baths with which the following co-ordinated exercises may be associated," cannot fail to provoke a spirit of critical scepticism.

The charts which accompany the booklet represent figures for the practice of movements described in the text. Similar exercises may be devised by any intelligent practitioner provided he thoroughly appreciates the principle involved.

Surgical Instruments in Greek and Roman Times. By JOHN STEWART MILNE, M.A., M.D., Aberdeen. Oxford: Clarendon Press.

WE congratulate Dr. Milne upon this admirable study in a department of archæology which has, so far, received comparatively little attention.

The work was presented as a thesis for the degree of M.D., and we can well understand that it was successful in gaining the highest honours.

The student of medical history will find in the volume the results of what must have been a most painstaking and laborious investigation into ancient literature, with the object of illustrating and explaining the means by which the old Greek and Roman surgeons were enabled to prosecute their craft.

Laborious though the task may have been, the author has contrived to place before the reader a volume which is as full of interest as it is of erudition. After giving a short account of the chief medical writers of old, there is a chapter upon the materials, execution, and ornamentation employed in the manufacture of the instruments, which are described in succeeding chapters under the headings "knives," "probes," "forceps," "cauteries," "sutures," etc. In addition to a complete bibliography, there is an inventory of the chief instruments to be found in various museums abroad and in this country, together with a large number of photographs, which illustrate and greatly increase the interest of the text.

The book redounds not only to the credit of Dr. Milne and his Alma Mater, but also to that of archæological science in this country.

Letters on Psychotherapeutics. By Prof. H. OPPENHEIM. Translate by ALEXANDER BRUCE, M.D. Edinburgh : Otto Schultze & Co.

THESE letters on psychotherapeutics are, in fact, actual letters of candid speaking and sound advice which Professor Oppenheim has from time to time written to neurotic patients. We all know how difficult it is to deal with such cases; when sufferings are partly real, partly imaginary, how difficult to steer between the Scylla of overkindliness and the Charybdis of lacking sympathy; while attempts to make patients understand the nature of their symptoms are often fruitless—sometimes, it must be admitted, because the medical adviser cannot put clearly into words the causal nexus between physical ailments and mental constitution. To all who have felt such difficulties we strongly recommend the perusal of this little book. The letters are models of clear thinking and lucid expression, and cannot but be helpful,—indeed, it might occasionally be advisable to give the book into the hands of the patient for personal study. The translation is excellent, and Dr. Bruce is to be thanked for rendering Professsor Oppenheim's "Letters" more generally available.

The Book of Receipts (Beasley). By E. W. LUCAS, F.I.C., F.C.S. Eleventh Edition. London: J. & A. Churchill.

BEASLEY'S "Druggists' Receipt Book," the last reprint of which was published twelve years ago, was so deservedly popular that we hail with pleasure the present edition. During recent years, however, great advances have been made in pharmaceutical and manufacturing knowledge; and therefore Mr. Lucas' task has meant not only re-editing but also re-writing the volume. This he has accomplished in a most satisfactory manner, and the volume contains the latest formulæ and methods, together with a chapter on urine analysis and the examination of waters, milk, and sputum. There is an admirably arranged selection of reference tables and other data useful for the pharmacist and analyst; and the book should not only prove of value to them but should also find a place on the shelves of the medical practitioner, to whom we can thoroughly recommend it.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Pierre Marie's Views on Aphasia.

During the past year the correctness of current doctrines concerning aphasia have been severely questioned by Pierre Marie, the distinguished neurologist and physician-in-chief to the infirmary of Bicetre. His criticisms are founded on observations extending over a period of ten years on nearly a hundred aphasics, and on more than fifty autopsies. In Marie's opinion (*Semaine méd.*, Paris, 1906, pp. 241–247), writers on aphasia have been too largely swayed by theory and graphic schemes of the mechanism of speech, and have thus been led to conclusions at variance with fact. Wernicke's localisation of the lesion of word-deafness in the posterior part of the first temporal convolution was an example of that method. He was led to the idea by Meynert's description of that area as the anatomical centre for hearing, and in the sequel discovered the form of aphasia which bears his name. Nothing, however, justifies the supposition that the first temporal convolution is actually the centre for hearing, and Wernicke erred in so far as he made the notion the keystone of the arch of the doctrine of sensory aphasia. Marie, approaching the subject without preconception, and following only clinical-pathological methods, has reached quite different conclusions.

One fact dominates the study of aphasia: "*In every aphasic there is more or less pronounced difficulty in understanding spoken language.*" Some patients comprehend nothing; others can perfectly understand simple questions, but fail to follow those which are in the least involved. Thus, if instead of limiting the tests to such orders as "Put out your tongue," more complicated questions be put, the defect of comprehension becomes manifest. No aphasic, for instance, can correctly execute such a command as this, which is a clinical test in use in Marie's wards: "There are three scraps of paper of unequal size on the table; give the biggest one to me, crumple up the middle one and throw it on the floor, and put the smallest in your pocket."

Inability to do this is not due to word-deafness, for in many cases if the complicated order be split up into separate parts each can be performed correctly though the command uttered as a whole is not understood. Moreover, in marked cases of aphasia an elaborate pantomime cannot be correctly reproduced. There is, therefore, something more than failure to comprehend speech,—there is *a very marked diminution in the intellectual capacity in general.* Mental reduction ought, Marie believes, to be given a prominent place in any theory of aphasia; he refuses to accept the statement that in the condition the intelligence is intact. The mental failure of such patients is shown rather by loss of accomplishments they have been taught, than by alterations of the affective faculties. Thus the musician becomes incapable of composition, the man of business makes mistakes in simple arithmetic, and cannot correctly set the hands of a watch which has stopped. A cook in Marie's ward, suffering from moderate aphasia, had forgotten how to fry eggs in the orthodox fashion, and produced an uneatable dish without apparently noticing that anything was wrong. Intellectual deficiency is discoverable in every aphasic in whom it is sought; the reason why it has so largely escaped observation is the absence of disturbance of the affective faculties, which enables patients to act normally in their social and family relationships, where only simple habitual activities are required, and initiative is not demanded. Turning to motor aphasia, Marie urges two orders of facts against the theory that the third left frontal convolution is a speech centre—(1) In some right-handed persons isolated destruction of the area has not resulted in aphasia; (2) in some well-marked cases of Broca's aphasia the third left frontal convolution has been intact. The conclusion is that the area plays no special rôle in the function of speech. How to explain the immense array of cases in which Broca's aphasia has coincided with lesion of the area? The fact is undeniable, but we must interpret it correctly. Now aphasia is generally due to cerebral softening from obliteration of the Sylvian artery; when the block is proximal to the origin of the branch supplying Broca's convolution, the latter is necessarily involved—but this is coincidence only, and has nothing to do with the aphasia which occurs. Having argued that sensory aphasia is not merely word-deafness, but involves a reduction of the mental faculties, and that Broca's convolution is not concerned in the production of motor aphasia, Marie goes on to formulate his own views on the real nature of the condition,—views, he repeats, resting wholly on clinical and pathological observations. He sets out with three definitions—(1) Wernicke's aphasia is characterised clinically by the fact that the patients *can speak*, though badly; they understand badly, they cannot read, they cannot write; these, not from so-called word-deafness, but from intellectual defect. (2) In Broca's aphasia patients cannot read or write, understand badly, and *cannot speak*. The last point, *the presence or absence of speech, is the only essential difference between Wernicke's and Broca's aphasia.* (3) Anarthria is the absence of speech, or at least of comprehensible speech; unlike aphasics, the patients can read, write, and understand. They are the cases described as subcortical motor aphasia. Anarthria should be strictly separated from true aphasia, because it contains no element of mental defect.

What, then, is the locality of the lesion causing these three syndromes? Anarthria is due to a lesion in the region of the lenticular nucleus on either side, not the left only. Aphasia Marie considers a single entity, whether it shows itself clinically as Wernicke's or Broca's aphasia; the latter being sensory aphasia complicated by anarthria. Broca's aphasia = Wernicke's aphasia + anarthria, as he briefly expresses it. Aphasia, then, is caused by a lesion in one situation only—the supra marginal and angular gyri and the bases of the first and second temporal convolutions on the left side, the so-called "Wernicke's area," or the "association centre" of Flechsig. It is a mistake to attempt to subdivide this region into smaller centres presiding over such individual functions as auditory memories, etc., because the lesion implicates both cortex and white matter, and this would make it impossible to appreciate the topography of such centres, even were their existence proved, which it is not. The only definite fact in this connection is that the severity of the aphasia is proportioned to the extent of the destruction of brain substance. In Wernicke's aphasia the lesion is limited to this centre; in Broca's aphasia,—*i.e.* aphasia + anarthria,—the lesion involves Wernicke's area *and* the region of the lenticular nucleus. The lesion which is most common is softening due to obliteration of the Sylvian artery; it is large or small, cortical or subcortical, according to the site of the block, and the arterial twigs involved. Marie discusses these anatomical points fully, but they do not lend themselves to summary; it should be said, however, that he lays much stress on the part individual peculiarities of arterial distribution play in determining the extent of softening. Variations in this respect explain why in some cases of motor aphasia there is softening of the third left frontal, the origin of the branch supplying this convolution being inconstant. Cerebral hæmorrhage may cause Broca's aphasia without lesion of the third left frontal when it destroys the lenticular nucleus region and spreads back to the temporo-parietal isthmus of white matter and its neighbourhood. Mental deterioration is on the whole less in motor than in sensory aphasia, and this is explained by the lesion producing it,—namely, deep-seated rather than cortical softening, in the neighbourhood of the temporo-parietal isthmus and lenticular nucleus.

A further communication (*Semaine méd.*, Paris, 1906, pp. 493–500) deals with the subject of pure (Dejerine) or subcortical (Lichtheim) aphasias, ascribed to lesions cutting through the fibres emanating from auditory, visual, or motor word centres, but not implicating the cortex, —pure word-deafness, pure word-blindness, and pure motor aphasia. 1. *Pure word-deafness.*—Marie denies that this exists. He has never clinically observed the condition; further, it is impossible to conceive word-deafness without defect of intelligence which would react on the comprehension of other modes of speech. He finds all the records of cases insufficient to prove that pure word-deafness ever exists. Briefly, pure word-deafness is a myth, due to faulty observation, the most frequent error being failure to recognise mild grades of labyrinthine deafness. Some of these auditory disturbances set in with disequilibrium and other symptoms suggestive of an apoplectic attack. 2. *Pure word-blindness.*—Marie admits that some patients have a disturbance of the power of reading, which, if not the sole symptom, at least predominates greatly over all the rest. According to Dejerine, this is caused by a lesion of the association fibres which connect the common visual centre with the left angular gyrus, in which is stored the visual memory of words. Marie disputes the existence of this centre; he holds that the lesion causing alexia is not situated in the domain supplied by the Sylvian artery, but in that of the posterior cerebral. Softening, therefore, spares Wernicke's area, and involves part of the optic radiation, hence the frequency with which right hemianopsia accompanies word-blindness. To cause alexia, the lesion must be left-sided, involve the visual fibres in the optic radiation, and impair the integrity of the white matter of Wernicke's area. The site which fulfils these conditions is the lingual and fusiform lobules on the inferior aspect of the cerebrum. The degree to which Wernicke's area is impinged upon will depend to some extent on minor variations in the arterial distribution in different persons. Pure alexia, therefore, is hardly a true aphasia at all; nothing justifies the supposition that the angular gyrus has anything to do with its production, or with the recollection of written language. The noteworthy point in its pathogenesis is its dependence on lesions situated in the territory supplied by the posterior cerebral artery. 3. *Pure motor aphasia.*—This was created by Lichtheim, and has been specially studied by Dejerine. It is characterised clinically by retention of the comprehension of language and a knowledge of words, inability to utter them being its sole symptom. This, according to Marie, is simply anarthria. He, however, does not limit the term anarthria to defective speech from paralysis of the muscles of articulation, phonation, etc., but regards disturbance of co-ordination without paralysis as equally productive of inability to speak. The lenticulo-striate region appears to have an important influence on the mechanism of speech, probably through acting as a co-ordination centre; bulbar lesions, on the other hand, lead to anarthria or dysarthria by causing paralysis of the muscles.

Marie summarises his criticism of aphasia thus: The distinction between cortical and subcortical aphasia falls. No aphasia due to focal lesion is ever exclusively cortical. The best classification is—(1) Intrinsic aphasia (Wernicke's and Broca's aphasia) in which the language area is involved; (2) extrinsic aphasia, in which the language area is not directly implicated. The lesions causing extrinsic aphasia impinge, as it were ("action de 'voisinage'"), on the language area either from the occipital lobe (pure alexia) or from the lenticulo-striate region (pure motor aphasia). The third left frontal convolution plays no part in the function of speech. The true speech centre is in Wernicke's area; it should be looked on as an intellectual rather than a sensory centre. The degree of speech disturbance depends on the size of the lesion. Anarthria is due to lesion of the lenticular region, with interference with co-ordination, but no true paralysis. Wernicke's aphasia is due to lesion of the language centre; in Broca's aphasia there is added affection of the lenticular region. Pure word-deafness does not exist, and the first left temporal convolution is not a centre for the memory of words.

Pure alexia exists clinically, and is due to lesion of the posterior cerebral, not, like the rest, to affection of the Sylvian artery.

A third contribution (*Semaine méd.*, Paris, 1906, pp. 565–571) is interesting as an historical study of the circumstances which led Broca to conclude that the convolution bearing his name was the motor speech centre. The brains of his cases are preserved in the Musée Dupuytren. In Case 1 there is an extensive lesion involving both the third left frontal convolution and Wernicke's area. Broca inferred that the former was the speech centre because the lesion seemed of oldest standing here, and the aphasia had been of long duration. In Case 2 there is no focal lesion of the third left frontal. Broca found a cavity which he took to be an apoplectic cyst, while Marie interprets it merely as senile atrophy. It does not seem that in this case the patient presented clinically any true aphasia. In the first case, the lesion was such as to agree with Marie's views, the softening of the third frontal being an accidental coincidence. Certain circumstances at the time, also, contributed to establish the discovery of Broca as a dogma. In 1861 Bouillaud was one of the leaders of medicine in Paris; imbued by the doctrines of Gall, he had already expressed the view that the faculty of speech resided in the frontal lobes, and welcomed Broca's discovery as a solid proof of this, as well as hailing the discoverer as a convert to the school of "*localisateurs.*" By 1866 Broca's theory was pretty generally admitted, and in 1870 came the discoveries of Hitzig, Fritsch, Ferrier, and Yeo, and the theory fell naturally into place as a dogma.

Criticisms of Marie's views by Dejerine will be found in the *Presse méd.*, Paris, 1906, pp. 437, 453, and 742, and a number of cases supporting them in the *Semaine méd.*, Paris, 1906, pp. 514, 524, 574, 588, and 610.

SURGERY.

UNDER THE CHARGE OF

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THE TREATMENT OF SURGICAL TUBERCULOSIS BY HYPERÆMIA.

MANY of our conceptions of inflammatory processes, and of the methods of treating these, have had to be revised in the light of Bier's recent observations on the use of artificially induced hyperæmia as a therapeutic agent. The strong case put forward by Bier regarding the beneficial effects of hyperæmia in the treatment of acute pyogenic inflammations has convinced all who have given the method a fair and intelligent trial. When he first introduced his plan of treating tuberculous lesions some years ago, many who tried the method were disappointed with the results obtained, and in this country, at least, it fell out of use for a time. Interest has again been aroused in the matter, and a paper read on behalf of Professor Bier, by his assistant v. Schmieden (*Med. Rec.*, N.Y., 1907, August 17) should do much to obtain for the method a further trial. The inflammatory reaction which ensues upon infection of the tissues by organisms is the means taken by nature to resist the invasion, and Bier's object is to reinforce this protective process by increasing, within limits, the inflammatory condition. This he does by concentrating the blood in the infected area, so that redness, swelling, and heat, three of the cardinal signs of inflammation, are increased. The artificially induced hyperæmia must not go beyond this. "It is absolutely wrong to think that if a little is good, more is better," and the success of the procedure depends upon striking the happy medium. The bandage should be applied at some distance proximal to the tuberculous joint; for instance, in tubercle of the wrist-joint it is put on above the elbow. It must not cause pain either where it is applied or in the diseased joint. Below the bandage, the limb becomes swollen, and assumes a bluish-red hue, but it remains as warm as the other limb and the pulse is entirely unchanged. In tuberculosis, the bandage is only on for a few hours per day. It may, for example, be applied for one or two hours at a time; or twice for an hour or for two hours at intervals. While the constriction bandage is on, all other dressings are removed, save for a piece of sterile gauze placed over any sinuses which may be present. The affected joint must not be immobilised, and the patient should be encouraged to move it frequently during the day. When the lower limb is involved, jarring of the articular surfaces should be prevented by suitable appliances, but the joint should not be fixed. Bier claims that it is possible to obtain a cure by this method, even when the disease has progressed so far as to have caused changes in the bones and cartilages associated with multiple fistulæ. The first signs of improvement are abatement of the pain and the disappearance of inflammatory contractures with restoration of movements. Later, the swelling subsides, fungous masses are converted into firm fibrous tissue, which soon becomes absorbed, and the contour of the bones again becomes visible. If a cold abscess forms, it is treated by the cupping glass and opened; never injected with iodoform. Such an incident is not looked upon as unfavourable, but rather as an evidence that nature is overcoming the infection and casting off the débris. The congestion treatment is not to be interrupted if a cold abscess forms. It is frankly admitted that the curative process takes a long time; nine months or even longer for the healing of a severe joint affection. In Bier's clinic, all cases of joint tuberculosis, except hip-joint disease, are treated by this method. It has hitherto been found impossible to apply the plan to the hip-joint efficiently. The shoulder can be treated by a rubber ring or a length of rubber tubing, but care must be taken that the pressure does not injure the skin, as the site of the constricting band cannot be changed. The best results are obtained in the ankle, elbow, and wrist; and neither the severity of the disease nor the advanced age of the patient is looked upon as a contra-indication. The complicated structure of the knee-joint renders it less favourable, and it is often an open question whether a more speedy and certain result can be obtained by resection. It is often necessary to combine extension and the application of splints with hyperæmia in the case of the knee-joint. The exudative form (hydrops) is not treated by hyperæmia, but by aspiration and injection of iodoform emulsion.

In situations where a constricting bandage is inapplicable, for example, in cold abscesses, tuberculous lymphatic glands, tubercle of the testis, or tendon sheaths or serous membranes, the cupping glasses employed by Klapp should be used. The cup is applied for about three-quarters of an hour, being left on for five minutes at a time, and then taken off for three minutes. The hyperæmia area should be red, not blue. The pus is allowed to escape by an incision, and no packing or drain should be introduced. Bier sums up thus: "Formerly I considered the hyperæmic treatment of tuberculosis good, now I consider it the best."

On the Parathyroid Glands, and Tetany following their Removal.

It is only within the last few years that the nature of the parathyroid glands has been fully appreciated, and their rôle in the production of tetany after operations for goitre recognised. In a recent paper, H. M. Evans (*Ann. Surg.*, Phila., 1907, October) reports the results of a series of observations carried out on the human subject with regard to the blood supply of these glands. His conclusions are—That the parathyroid glands are always supplied by definite parathyroid arteries which enter them in each case at the hilus; that the parathyroid arteries, superior and inferior, usually arise from the inferior thyroid artery, but frequently they take origin from an anastomosing channel between the inferior and superior thyroid vessels; few, if any, direct vascular connections normally exist between the parathyroid glands and the connective tissue envelope of the thyroid.

As a supplement to Evans' paper, Halsted contributes some observations on the preservation of the parathyroid glands in operations upon the thyroid lobes. The glands are situated on or very near the posterior border of the lateral lobe of the thyroid gland and more or less in line with the channel of an anastomosis between the superior and inferior thyroid arteries. By following the "sub-capsular" method of removing the thyroid, as recommended by C. H. Mayo, the parathyroids, together with their arteries of supply, may be saved. As it is usually in the control of hæmorrhage that the parathyroids are sacrificed, Halsted describes how the vessels should be secured so as to conserve the parathyroid vessels.

Eugene H. Pool, in reporting a case of tetany para-thyreopriva (*Ann. Surg.*, Phila., 1907, October), discusses very fully all the aspects of the subject. The practical deductions he draws are that in operating for goitre it is not merely sufficient that enough thyroid tissue must be left to prevent the occurrence of myxœdema, but also that a definite part of the thyroid must be retained in order to ensure sufficient parathyroid tissue being left to guard against tetany. The operator must attempt to leave at least two of these bodies *in situ* with their blood supply unimpaired. It is therefore necessary to leave the posterior part of at least one lobe of the thyroid, in connection with which two of these bodies usually lie. Whether this is done by leaving one lobe completely or in part, is a matter for individual choice in a given case; but in pursuing either course the thyroid vessels, especially the inferior, on this side should not be ligated. In removing the other lobe the dissection should be carried as close as possible to the capsule of the organ, and in ligating the inferior thyroid on this side care should be taken to avoid the parathyroid gland which lies in close proximity to it.

CONGENITAL COMMUNICATION OF THE RECTUM WITH THE PROSTATIC URETHRA.

In reporting a case of this deformity, Stettiner of Berlin (*Centralbl. f. Chir.*, Leipzig, 1907, August 3, Supplement) points out that the blind lower end of the large bowel may communicate with the urinary tract in three places—(1) At the summit of the bladder, the least common; (2) at the floor of the bladder, the most common; and (3) in the prostatic urethra.

For the first of these conditions a laparotomy is required, the bladder being dissected off and closed, and then the blind end of the rectum pushed through to the perineum. The same treatment may be required for a fistula lower down, but the operation is too serious in the newly born. It is better, therefore, to make an opening in the rectum in the first instance and defer the closing of the fistula till a later period. On account, however, of the danger of infection of the urinary tract, the author recommends that if this two-stage operation is adopted the second stage should follow the first as soon as possible.

He showed a boy æt. 13 months, in whom there was a communication between the rectum and the prostatic urethra, and the first operation was done on the second day after birth. The incision was made in the middle line from the scrotum to the coccyx. The blind end of the rectum lay at a depth of 6 cms. It was opened and stitched. Four weeks later, a metal catheter having been placed in the urethra, another incision was made in the middle line, partly by cutting and partly by blunt dissection. It was found that at the seat of communication the urethra was completely divided. It was therefore stitched over a rubber catheter, which was kept in; and the rectum was properly stitched and brought out in the perineum. A urinary fistula formed in the perineum, but after the catheter was again introduced it closed in five weeks. Bougies were repeatedly passed down the urethra, and the child made a good recovery.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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SYPHILITIC METRORRHAGIA.

MURATOW (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 27) believes that syphilitic conditions of the uterus are more frequent than is generally believed. He reports two cases of obstinate uterine hæmorrhage, which resisted all treatment till mercury was given, and cured the condition. Muratow thinks that the uterus in those cases resembles syphilitic affections of the stomach, in which hæmorrhage occurs. There are no specific symptoms associated with such metrorrhagia, and hæmophilia has been suspected where the bleeding has been very profuse and persistent. In all cases of obstinate bleeding from the uterus, where the etiology is not clear, it is desirable to inquire for a syphilitic history before resorting to operative treatment. Many of those cases are promptly relieved by mercury and iodides.

ALBUMINURIA WITH UTERINE FIBROIDS.

Venot (*Rév. franc. de méd. et de chir.*, 1907, August 10) believes that most fibroid cases that die after operation succumb as a result of kidney complications. The amount of albumin in those cases is very variable, but it disappears after removal of the fibroid. Recovery may, however, occur with persistent albuminuria. Venot describes three types of cases. In the first, the kidney condition may be the result of a pre-existing nephritis and independent of the fibroid. In the second group, the fibroma causes or aggravates an existing nephritis, which will be relieved by removal of the tumour. The third group includes cases where the ureters are directly pressed on. If the condition is acute and associated with copious albumin and fever, operation is urgently demanded to relieve the pressure of the tumour on the ureter.

REMOVAL OF THE APPENDIX IN GYNÆCOLOGICAL OPERATIONS.

Pankow (*München. med. Wchnschr.*, 1907, July 22) has made histological examination of the appendix removed during operation for gynæcological lesions in 150 cases. He finds it affected in 60 per cent. of gynæcological cases. Appendicitis is frequently the cause of closure of the tube and resulting sterility; and many cases of right-sided pain, attributed to the ovary, have their origin in the appendix. Pankow believes that when the abdomen is opened for another condition, the appendix should be removed at the same time.

CÆSAREAN SECTION IN CASES OF INFECTION.

Veit (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, 1907, July) points out that in such cases it is necessary to close the peritoneal cavity so as to protect it from infection by non-sterile fluids in the uterus. The abdominal incision is made in the usual way, the uterus is then stitched to the edges of the abdominal wound, and opened into by a vertical incision. The operation takes longer than the classical Cæsarean section, but without greater danger to mother or child.

SUBCUTANEOUS HEBOTOMY.

Kannegiesser (*Arch. f. Gynäk.*, Berlin, Bd. lxxxi. S. 566) reports on thirty cases with no fœtal or maternal mortality. The operation was undertaken in different forms of contracted pelvis, when the true conjugate measured from 8 to 6·5 cms. Kannegiesser would limit the operation of Cæsarean section to cases where the conjugate measures 6 cms. or under. He gives the subsequent histories of eighteen out of the twenty-one cases previously reported. All those women were able to resume work after leaving hospital; in five a slight prolapse of the vaginal walls was noticed. Four children died after leaving hospital, death in each case being due to digestive trouble.

The Justification of Hebotomy.

Rühle (*Arch. f. Gynäk.*, Berlin, Bd. lxxxii. S. 236) is not sanguine regarding the future of this operation. He considers that the maternal mortality is too high (5·94 per cent.), and that serious injuries to the vagina and bladder are too frequent. He agrees with Zweifel that the natural powers should be given a chance after the bone has been divided, and that extraction of the child with forceps should not be immediately resorted to. Most of the serious injuries to the bladder and vagina have resulted from too forcible extraction. Rühle advocates the operation at the onset of labour, especially in multiparæ. Hebotomy is contra-indicated in flat pelvis with a true conjugate below 7·5 cms. and in general contracted pelvis with a true conjugate below 8 cms.

A Large Intraperitoneal Hæmatocele from Hæmorrhage in a Corpus Luteum.

Engstrom (*Arch. f. Gynäk.*, Berlin, Bd. lxxxii. S. 60) reports a case of hæmatocele which before operation had been considered to be the result of tubal pregnancy. The tubes, however, were found perfectly normal, while the left ovary showed a large coagulum opposite the hilum. This clot was connected to the outer pole of a fresh corpus luteum, and the hæmorrhage had originated in the parenchyma of the ovary at a spot where the follicle had ruptured. The hæmorrhage had occurred after a severe attack of influenza. Microscopical examination showed an absence of fœtal elements.

The Treatment of Dysmenorrhœa.

Polano (*München. med. Wchnschr*, 1907, No. 35) describes four types of this condition. The first is due to mechanical obstruction, the second to inflammatory changes in the endometrium, the third to reflex conditions from the ovaries, and the fourth a manifestation of a general hysterical condition. He recommends a line of treatment depending on the physiological relationship between the ovary and mamma. The congestion of tubes and ovaries is diminished by acting on the breasts so as to stimulate their functional activity. This is done by applying Bier's suction apparatus to each breast some days before the onset of menstruation, to be reapplied for a quarter to half an hour at a time till the end of the period. Secretion of milk may be produced, and menstruation may stop for a considerable time. The dysmenorrhœa is relieved in many cases.

OVARIOTOMY DURING PREGNANCY.

FLATAU (*Arch. f. Gynäk.*, Berlin, Bd. lxxxii. S. 452) gives statistics of 234 ovariotomies performed during pregnancy, with forty-nine abortions. As abortion was likely to have occurred in twenty-two of those cases even without surgical interference, Flatau reduces his number to 212 ovariotomies, with twenty-seven abortions (10·3 per cent.). His investigations show that with expectant treatment 17 per cent. of all cases of pregnancy complicated by new growth of the appendages abort, and he therefore urges operation. He recommends the abdominal route, very gentle handling, and operating with the patient in the horizontal position, the Trendelenburg position being strongly contra-indicated.

THERAPEUTICS.

UNDER THE CHARGE OF

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THE THERAPEUTIC ACTION OF EXTRACT OF KIDNEY ON CHRONIC NEPHRITIS.

FORMÁNEK and Eiselt have tested the effect of administering a fresh extract of kidney substance upon the course of chronic nephritis. Their observations were carried out upon a series of five cases. It is stated that by the administration of fresh kidney substance a substance is introduced into the system which antagonises the toxic substances normally produced in the tissues. In diseased conditions, the kidneys are unable to produce such antagonising substances, or at any rate do so to an inadequate degree. Previous observers state that the administration of fresh kidney preparations to nephritic patients reduces the excretion of albumin, while it increases the diuresis. This result followed whether the renal preparation was given by the mouth or by subcutaneous injection. Formánek and Eiselt are able to confirm these favourable statements. Owing to the difficulty of preparing a reliable sterile extract, they preferred to give the drug by the mouth. The plan they adopted was as follows:—The kidneys were removed from pigs immediately after death, and were then reduced to pulp in a sterile mincing machine. This pulp was transferred to a covered sterile glass dish and covered with a solution consisting of 300 c.c. of water in which 5 grms. of NaCl and 5 grms. of $NaHCO_3$ were dissolved. After acting for twelve hours in the cold, this extract was removed, sweetened with saccharin, and coloured with a dark tinted syrup. The extract was freshly prepared each day, and the daily dose was 250 c.c. The diet consisted of milk, soups, rolls, and the only flesh allowed was cooked veal. To estimate the amount of albumin, the following method was used. From 50 to 100 c.c. of urine was taken. The albumin was coagulated by boiling after the addition of NaCl and acetic acid. The precipitate was collected on an ash-free filter paper and washed several times with hot water till the filtrate gave no chlorine reaction. Then the precipitate was examined for N by Kjeldahl's method. The results of the treatment may be summarised as follows. The diuresis always markedly increased with diminution in the total excretion of albumin. In all the cases the blood pressure was reduced, and in some cases the sight and retinal condition improved. These favourable results are only obtainable in cases where the kidneys are alone at fault. Thus in a case when there was secondary failure of the heart, no benefit was obtained. So far as the authors' experience goes, no ill-effects follow the use of the kidney extract.—*Arch. internat. de Pharmacod.*, Gand et Paris, 1907, Bd. xvii. Fasc. 3–4.

MARMOREK'S SERUM IN TUBERCULOUS CASES.

SCHENKER reports his experience with this serum in a series of thirty-nine cases. In order to make any action of the serum more obvious, he selected cases in which the physical signs were definitely marked and the sputum contained tubercle bacilli. Only a few cases were at the initial stage; the majority were severe cases. In addition to the serum treatment the patients received suitable diet and were subjected to a systematic open-air treatment, which involved from five to six hours' stay in the open air each day. The serum was, as a rule, administered by the rectum. Given by the mouth the serum had little action. After a few trials of subcutaneous administration this method was given up, as it appeared frequently to produce unpleasant side effects. By the rectum the administration was well borne and produced no disturbance in adults, though in the case of young children special measures had to be adopted to prevent the escape of the serum. In the case of adults, after a cleansing enema the serum was injected by means of a soft Nélaton catheter into the lower part of the descending colon. The average dose was 10 c.c., administered thrice weekly. Children received half this dose, six times in the week. Latterly all patients over 12 years of age have been given 10 c.c. doses daily. This has caused no unpleasant effects, and seems to give more rapid therapeutic results, in that the sputum disappears more rapidly and the general condition improves correspondingly. All the patients were subjected to periodic examination, and in the examinations of the sputum the presence of other organism apart from the specific organism of tuberculosis was determined. Almost all the cases were instances of mixed infection, and in such cases the effect of the serum seemed at first to reduce the tubercle bacilli, while at the same time the other organisms tended to increase as if their growth was stimulated by the serum. In the course of the further treatment they too gradually diminished. One almost constant effect of the serum was a permanent increase in pulse rate. After the second or third injection the pulse rate rose to 100 or upwards, and remained at this rate so long as serum treatment was continued, but this never seemed to cause any discomfort. In all the cases examined the serum produced a leucocytosis. In two cases the use of the serum caused abdominal discomfort, which in one case was so severe that the treatment had to be stopped. Of twenty-seven cases which at the commencement of treatment had tubercle bacilli in the sputum, in eleven the bacilli disappeared completely, while in a further series of seven cases the number of the bacilli has distinctly diminished. In the remaining cases the bacilli have not been reduced in number. The average duration of treatment was sixty-nine days, and the number of injections varied from eight to seventy-six. Tested in another way, it was found that after the lapse of two years eight patients were able for any work, while eleven were able to do light work. Considering that the cases were so bad that only a very few of them would have been admitted into a sanatorium, these results are favourable. In no case was any immediate striking improvement obtained with the serum, but any benefit obtained was gradual. This showed itself in increase of appetite and greater vigour. With this was associated fall of temperature, diminution is sweating, and lessened cough. At first the sputum becomes thinner but of increased quantity. With this there is found on auscultation an increase in the intrapulmonary signs. With continued treatment, these symptoms gradually disappear, and in the most favourable cases a condition is eventually reached in which râle disappears and the only morbid signs are slight impairment of resonance with prolongation of expiration. In two cases, signs of cavity disappeared. Favourable results were also obtained in the treatment of tuberculous disease of the bones, peritoneum, kidneys, etc. Schenker concludes that the effect of the serum is of an antitoxic nature. He is so impressed with the benefit obtained by it that he advocates its use even in advanced cases of tubercle as the most likely means of arresting the disease. He does not consider that it is the last word in the treatment of tuberculous disease, but in the present state of our knowledge it constitutes a distinct advance on other methods of treatment.—*München. med. Wchnschr.*, 1907, October 22.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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IMPROVEMENT OF VISION IN ALBINISM.

In the albino there are apt to be at least three obstacles to good vision—myopia, nystagmus, and a form of photophobia called day-blindness. The myopia results partly at least from the weakness of the coats of the eye; the nystagmus is perhaps to some extent protective, preventing too great using up of the scanty pigment in one area of the fundus; and the photophobia is largely caused by the fact that light can enter not merely through the pupil as it ought to do, but even through the coats of the eye themselves. It occurred to Komoto to try whether he could minimise this last evil by increasing the pigment over the exposed parts of the front of the eye. In a lad of 16, an albino greatly troubled with this photophobia, he injected a suspension of Indian ink under the conjunctiva in such a way that it would be as far as possible hidden by the upper eyelid, and by this simple procedure raised vision from counting fingers at 5 ft. to $\frac{6}{60}$, and the uncomfortable blurring was greatly diminished. He then turned his attention to the eyelids, and to render them less pervious to light injected more Indian ink into them: they thus became more efficient screens. He achieved so much success that vision now reached $\frac{6}{18}$. Against this gain, immense as it is, is to be placed the dreadful unsightliness of a sclerotic thus blackened; so Komoto made a number of experiments to endeavour to find some inert substance, itself light yellow or white in colour, which was yet sufficiently opaque to intercept the excess of light. Judging from his experience with rabbits, he decided to try a suspension of carbonate of lead, and employed it when treating the same lad's other eye; unfortunately, however, without any success, for though there was very little reaction indeed and the aspect was not materially disfigured, yet vision was not improved at all, and he had to revert to the use of ink, with which he again attained success. Three suggestions may be valuable in this connection, namely—As the patient is very frequently myopic and has to wear glasses, the deformity might be at least partly concealed by having these tinted; the ugliness might be yet more concealed by shortening the palpebral aperture, whereby less of the sclera becomes visible; and if the injection is confined to the lids and the conjunctiva left untouched, and the injection made sufficiently deep, the lids may not show very much darkening. By attending to these points one may obtain for a distressed patient an enormous gain at not too great a cost.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1907, May–June.

SUBJECTIVE SENSATIONS OF COLOUR PRODUCED BY INTOXICATION WITH VARIOUS SUBSTANCES.

IN various diseases in which absorption of toxins plays an important part, such as epilepsy aud tabes, coloured vision is not altogether infrequent; a similar symptom occurs sometimes after operation on the eye (erythropsia after extraction of cataract), and in the course of certain illnesses. It is, however, with this symptom as the result of the ingestion of substances that Hilbert (Sensburg) deals in a recent paper. So far as he is aware, the first definitely recorded case was that of Pantonillet, whose patient complained of seeing all objects tinted of a reddish or even scarlet colour after having eaten the seeds of hyoscyamus. Santonin has many times caused xanthopsia or yellow vision, and so, but more rarely, has picric acid or trinitrophenol. In the case of this last drug, one patient complained, two minutes after taking one-third grm., of yellow vision; the symptom passed off in about two hours, and was not succeeded by any blue (complementary) vision. Violet vision has been noted after over-indulgence in hashish or Indian hemp, and also in fungus poisoning. Blue vision has been noted after acute alcoholism, the symptom lasting three days. Red vision was complained of by a patient into whose conjunctival sac a solution of duboisin had been dropped, and it should be remarked in passing, as showing the central rather than the peripheral situation of the "lesion," that he saw red even with the eye which had not been thus treated. This has occurred also after the use of atropine and of scopolamin, all being drugs derived from plants of one variety of the *Solanaceæ*. Quinine has caused everything to appear as though enveloped in reddish flames. Yellow vision has been caused by the absorption of chromic acid applied to the feet on account of hyperidrosis; also of salicylate of soda taken internally, and in carbonic oxide poisoning, in snake-bite, chronic alcoholism, digitalis poisoning, and in over-use of tobacco and of phenacetin. Iodoform has also been known to cause xanthopsia. Green vision has been seen in optic atrophy, but ingestion of no substance has been known to cause this symptom.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1907, June.

EYE SYMPTOMS IN DISEASE OF THE ACCESSORY SINUSES OF THE NOSE.

THIS subject lies on the borderland separating two important specialties, a fact which partly accounts for the circumstance that our knowledge in regard to it is very limited and somewhat "scrappy," for the ophthalmic surgeon who sees the cases is frequently not deeply interested in the other bearings of them, and the rhinologist is apt to be aware merely in a vague way that the patient does not see well. But in a very careful and elaborate paper by Birch-Hirschfeld (Leipzig) we are given much information dealing with both sides of the subject. He restricts the paper, long though it is, in certain ways, by omitting (for the present) some aspects of the subject, and devotes himself chiefly to the elucidation of the question whether by examination of the eye one can obtain any illuminating indications as to disease of the sinus which may enable one to devise and adopt means for conservation of life or of vision.

It must be clearly noted in the first place, that it is quite possible that these cases may be more frequent than is generally supposed, since except for the eye symptoms it would sometimes be impossible to obtain any information in regard to the existence and nature of a lesion of the sinuses of ethmoid or sphenoid; and every ophthalmic surgeon will admit that in a number of cases of affections of the eye similar to those in which sinus disease is certainly present, he can gain no light whatever which will enable him to decide what may be the cause: perhaps some of these may be abortive cases of sinus disease.

Cases of scotoma or central defects of vision occur not infrequently; this is the usual symptom in a case of eye lesion brought on by sinus disease near the apex of the orbit. The scotoma or blind area may be large or quite small, and may be absolute or only relative. It is therefore readily missed, especially by those who are not very familiar with eye disease. Our author gives four cases in some detail, the records of which have much to teach us. Thus in his first, that of a woman æt. 35, the first complaint was loss of vision in her left eye. This might not impossibly have passed with little or no notice, but for the fact that her right one happened to be, from a totally different cause, practically useless. At this time she complained of no swelling in the upper jaw, but the upper bicuspid tooth on the left side was tender and carious. She was found to have a central scotoma for colours, but a good field. In spite of the removal of pus from the antrum, this scotoma became larger and "deeper," and slight protrusion of the eye came on, though the fundus, as indeed is quite frequently the case in retrobulbar neuritis, showed no alteration at all. By and by, however, complete atrophy of the optic nerve followed, not checked even by a more extensive operation than the former one; this time pus was sought for in both sphenoidal and ethmoidal sinuses, and evacuated from them. Had the first operation been more bold, the result might have been much more satisfactory. It seemed probable that in this case the inflammatory attack had spread from the antrum to the apex of the orbit, where it attacked the optic nerve and certain of the ocular muscles, and had then spread to the other sinuses.

It is not desirable here to go into details in regard to the other three cases: we give this as a type. In three of them, at any rate, there was no other symptom but the ocular manifestation to lead to any suspicion of sinus mischief. The author discusses somewhat minutely the question whether the implication of the papillo-macular fibres of the optic nerve is due to direct pressure in the bony canal, to an indirect influence on the nerve fibres caused by circulatory disturbances, to an interstitial neuritis, or to a toxic action set up by absorption from diseased bone acting injuriously upon a highly specialised and particularly susceptible portion of nerve. In most cases the author considers it probable that the lesion is due to vascular alterations, aggravated by toxic action. His paper is one of very great interest.—*Arch. f. Ophth.*, Leipzig, Bd. lxv. S. 3.

REPORTS OF THE MEDICAL SOCIETIES.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—*November* 6, 1907.—Dr. J. O. AFFLECK, President, in the chair.—Mr. COTTERILL showed various specimens.—Mr. COTTERILL also showed—(1) A patient after ligature ot the common carotid in a case of orbital angioma; (2) a case of sarcoma of the chest wall.—Mr. ALEXIS THOMSON showed—(1) A child with spontaneous fracture of the lower end of the femur, probably the result of osteo-myelitis fibrosa; (2) a child with unusual form of ununited fracture of the forearm.—Mr. STILES showed—(1) A patient after operations for epithelioma of the floor of the mouth; (2) a patient, æt. 80, after operation for malignant disease of the upper jaw; (3) a case of renal calculus in a patient who had suffered from Pott's disease of the spine (skiagram by Dr. Edmund Price).—The PRESIDENT delivered his valedictory address, in which he referred to recent advances in clinical methods of diagnosis, mentioning especially the examination of the blood, the estimation of blood pressure, and electrical investigations. He, however, while fully recognising the value of these advances, reminded the members that the older established methods of diagnosis were not to be neglected. Much information can be obtained by observing nature's manifestation of disease—the facies of disease. Clinical impressions derived from long experience are of great importance, especially in prognosis. The psychical factor was also dwelt upon, and the President concluded by briefly reviewing the work done during the two years he had occupied the chair. He was glad to find that many of the younger members had contributed papers, and he hoped that they would continue to do so. On the motion of Dr. Allan Jamieson, seconded by Mr. Cotterill, a hearty vote of thanks was awarded to Dr. Affleck.—Dr. JAMES RITCHIE, the new President, then took the chair; and Mr. GEORGE CHIENE contributed a paper entitled "A Preliminary Note on a Simple Operation for Uncomplicated Oblique Inguinal Hernia in Young Adults." In young children oblique inguinal hernias are recognised to be of congenital origin, *i.e.* there is a pre-formed sac. The probabillty is that a similar description applies to such hernias in young adults. Ligation of the neck of the sac at the internal ring has been proved to be efficient treatment for such cases, and it is not necessary to remove the sac. Neither is it necessary to draw together the conjoined tendon and the external oblique. The valvular action of the muscular fibres is quite sufficient without this. All that is necessary after ligaturing and dividing the sac is to stitch the incision in the external oblique and close the skin wound. The patients should be allowed up earlier than is usually the case after hernia operations, so that by exercise the muscles may be developed and the valvular action referred to secured.

EDINBURGH OBSTETRICAL SOCIETY.—*November* 13, 1907.—Professor **STEPHENSON** of Aberdeen was unanimously elected President.—The retiring President, Dr. J. W. **BALLANTYNE**, delivered an address on "The Hospital Treatment of Morbid Pregnancies," in which he pointed out the importance of endeavouring to establish pre-Maternity Hospitals or Wards, where the various complications of pregnancy might be studied and treated. In the Edinburgh Maternity Hospital there had been instituted for some years the "Hamilton" bed for the reception of such cases, and Dr. Ballantyne narrated a number of cases that had been treated during his terms of office. On the motion of Sir **ALEXANDER R. SIMPSON**, seconded by Sir **HALLIDAY CROOM**, Dr. Ballantyne was accorded a hearty vote of thanks for his address.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*November* 1, 1907.—Dr. **WALKER DOWNIE** in the chair.—Dr. G. B. **BUCHANAN** showed an infant successfully operated on for imperforate anus.—Dr. A. J. **BALLANTYNE** showed a patient with well-marked changes in the retinal vessels. Patient was suffering from nephritis, and the fundus showed when he first came under observation, besides atrophic spots and hæmorrhages, well-marked arterio-sclerosis of the retinal vessels, and also four aneurysms on the retinal vessels. Two of the four disappeared under treatment, and patient was dismissed. The blood pressure remained high throughout. He was readmitted, having had a smart relapse, and examination of the fundus showed no aneurysms, but their place was taken by white spots. The arterio-sclerosis had advanced, and one of the vessels showed only as a white line. The disappearance of the aneurysms while the blood pressure remained high was noteworthy.—Dr. A. J. **BALLANTYNE** also showed (for D. J. M. **COWAN**) a case of syringomyelia, which, in addition to the typical group of symptoms, had indications of paralysis of the cervical sympathetic.—Dr. T. K. **MUNRO** read a report on "A Case of Anæmia with Changes in the Spinal Cord," and showed sections of the cord.—Dr. A. B. **SLOAN** read notes on a severe case of diphtheritic paralysis. The initial attack in this case was severe; the fauces and nasal mucous membrane were affected, the glands were markedly affected, and there were numerous subcutaneous hæmorrhages. Nasal speech was noted on eleventh day, laryngeal paralysis and rapidity of heart's action on the fourteenth, and pharyngeal paralysis on the fifteenth. Nephritis with albuminuria and general œdema set in. For twenty-two days the patient was fed rectally, and for thirty-nine days in all had nasal or rectal feeding. The patient recovered; 72,000 units antitoxic serum were administered in all. The child's head was kept hanging over a pillow to allow of the escape of secretions, which were abundant. In his series of 160 cases and in another series of over 400 cases, it was found that there was a definite relation between the severity of the initial attack and the onset of paralysis, and also that the paralysis varied in severity in the same ratio. He considered that the present teaching that paralysis had no relation to the severity of the disease was misleading, although he recognised that in exceptional cases paralysis might follow mild cases, though in these cases treatment was usually neglected.—Dr. **ALEX. M'LENNAN** showed a specimen of adeno-fibroma removed from the female breast.—

Dr. J. G. Tomkinson gave a microscopical demonstration of the following lesions of the skin:—(*a*) Leprosy; (*b*) acanthosis nigricans; (*c*) angiokeratoma; (*d*) porokeratosis (Mibelli); (*e*) blastomycetic dermatitis; (*f*) ichthyosis hystrix; (*g*) pemphigus vegetans, etc.

Friday, November 15, 1907.—Dr. Walker Downie in the chair.—Dr. G. H. Edington showed a patient whose pericardium he drained on account of purulent pericarditis following on an abscess of the thigh. An exploratory puncture was made in the fifth interspace on the left side 1½ in. from the sternal margin. The radical operation was performed by resection of a small part of the fifth cartilage as near the sternum as possible. The internal mammary artery was ligated and divided, while the triangularis sterni muscle was pushed aside. The pericardium was readily made out, but at a greater depth than was anticipated. It was opened and a drainage tube inserted, and the patient did well.—Dr. A. A. Young read notes and showed patients who had received the following injuries:—(*a*) Fracture of both malleoli; (*b*) dislocation (compound) of the astragalus, necessitating removal of that bone; (*c*) fracture of fibula, with dislocation of foot backward. In all, recovery had been rapid and satisfactory. Early massage was advocated.—Dr. W. K. Hunter showed the liver from a case of cirrhosis of the liver in a child of 9 years (with microscopic preparations). The patient had been observed over many months and died from empyema following pneumonia. The cirrhosis was of the multilobular type, and was associated with ascites, slight jaundice, bile pigment in the urine, and pale although not clay-coloured stools. Distinct improvement took place on two occasions following the administration of ox bile, the bile disappearing from the urine and appearing more definitely in the stools. Post-mortem, the liver presented a somewhat cellular cirrhosis of the multilobular type, and while the right lobe was contracted the left was enlarged.—There was a history of liver disease in both grandfathers and also in the father and mother. Dr. Hunter expressed the opinion that monolobular cirrhosis might be due to a toxin brought to the liver by the hepatic artery, and that multilobular cirrhosis was due to a similar cause brought by the portal vein. Dr. Edington showed photographs of a case of mandibular cleft (macrostoma).

Forfarshire Medical Association.—*November* 7, 1907.—Mr. Greig in the chair.—Dr. M'Vicar showed a man the subject of osteitis deformans.—Dr. Pirie showed a case of dextrocardia in a young man who suffered from extensive phthisis of the right lung; the apex beat was above the right nipple.—Dr. George Miller showed a specimen of cerebral hæmorrhage into the right lateral ventricle which occurred in a girl æt. 17.—Dr. Mackie Whyte showed specimens of colloid cancer of the stomach. Dr. Whyte also read notes on a case of septicæmia treated by a specially prepared vaccine. The patient was a man, æt. 56, who had suffered from varicose veins and ulcers in the left leg off and on for sixteen years, and during February and March he was treated in the surgical wards of the Infirmary for phlebitis and ulcer of the leg. His temperature was above normal all the time of his stay, and he had two rigors. The leg healed, and he was sent to the Convalescent Home. There he was troubled with headaches, indigestion, and shiverings, and on the 27th of April he was sent back to the medical side of the Infirmary. On admission, apart from a high temperature, 104° F., and enlargement of the liver, little could be found; there was no ear discharge. Night sweats and rigors were frequent, the temperature rising fairly regularly in the latter part of the day and falling to normal or subnormal in the early morning. Blood films examined for malaria parasite were negative, leucocytes 9200. Widal's test was tried and found to be positive on the 9th and 15th of May, but with the absence of other symptoms the diagnosis of typhoid could not be entertained. On the 5th of June an examination of the blood showed a pure culture of *Staphylcoccus*. The opsonic index on the 6th was 1·2, and, on the 7th, 250 millions of sterile *Staphylococcus* vaccine, prepared from the patient's blood, was injected. From that day onwards he made a steady recovery. The negative phase after the injection was well marked, being 0·7 on 8th June, and it rose from 1·66, 1·83, to 2·6 on 15th June. He had a few unpleasant symptoms of headache and slight diarrhœa. On 18th June the blood was sterile, there being no growth in broth or agar after forty-eight hours. Since then he has been seen frequently and continues well. Dr. Whyte was of opinion that the treatment must be credited with the good result, as the vaccine with its 250,000,000 of dead cocci so altered the state of things in the blood that opsonins were produced in such quantity as to render the microbes a ready prey to the leucocytes. The necessity of using in such cases the patient's own particular strain of cocci was emphasised.—Dr. PIRIE gave an account of a visit he paid to the principal hospitals in Paris, Lucerne, Milan, and Venice. What impressed him most was the beautiful radio-graphic work done in Milan, and the radio-therapeutic work carried on in Paris. He gave a demonstration of new instruments, including a complete portable set of X-ray apparatus. He considered Watson's interrupter to be the simplest and best.—Mr. GREIG read notes of two cases in which the healing of persistent sinuses had been greatly expedited by the use of vaccines. In the first case sinuses had existed for six months, and the infection was purely staphylococcal. Only one inoculation was required, the staphylo-opsonic index rising thereafter from 1·7 to 2·5, and the sinuses healed within a fortnight. The second case was a pure *coli* infection following an enterectomy for tuberculous disease. The opsonic index was unusually high, and only a small amount of specially prepared vaccine was injected, with the result that the sinus, which had existed for fifty-two days, healed in a fortnight. Mr. Greig also read notes of a case of lymphoma of the rectum occurring as a single tumour in a woman æt. 30. He demonstrated its structure by a photo-micrograph, and pointed out the extreme rarity of the condition. He then read notes of a case of primary carcinoma of the appendix occurring in a man æt. 35, and of a case of rhabdo-myo-sarcoma of the prostate occurring in a child æt. 4 years, and demonstrated the structure by photo-micrographs.

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MEDICAL EDUCATION IN THE UNITED KINGDOM.

I. Education in General.

Before describing the requirements imposed upon all those who desire to obtain a degree or diploma with the right to practise medicine and surgery, a word may well be said about the important questions—Which degree or diploma to work for? and which teaching institution to attend? There are three courses open to the aspirant to medical honours. He may enter a university which affords education as well as confers degrees; he may study at certain medical schools, and take his degree at a university which does not possess a teaching staff; or he may enter for one of the licences to practise granted by certain medical bodies. A university degree has certainly greater credit associated with it, but now that a minimum course of study, lasting for at least five years, and including a large number of compulsory classes, has been made obligatory upon all graduates and licentiates alike, the difference between the instruction provided by the universities and by the different medical schools is not so great as formerly.

The usual sum for the class and degree fees spread over the five years is about £150 to £160, when necessary extras are included. The table on the following page gives approximately the minimum cost of obtaining the different degrees and diplomas.

The fees at the different London hospitals can be compounded for by one or two payments, the sum of which is less than the total if paid by annual instalments. The curriculum for the London Colleges' diplomas costs from £110 to £158, exclusive of the examination fees. Several of the London Colleges give substantial rebatements to sons of registered medical men. If the London University M.B. course is taken, the cost is somewhat greater. The degrees of the Scottish Universities cost, with the examination fees, from £115 to £145; the licence of the Scottish Colleges, from £115 to £130.

Until this year the four Scottish Universities had adopted an almost identical curriculum; in October 1907, however, a new ordinance becomes operative, by which the Edinburgh course of study diverges from the common plan, and becomes, it is hoped, more elastic and practical. The new curriculum is referred to on page vii.

Through the munificence of Mr. Andrew Carnegie, the cost of academic training has been lessened by the payment of the educational fees in the case of students of Scottish nationality, and also of those who have attended at any scholastic institution under the inspection of the Scotch Education Department, of whatever nationality, during at least two years after the age of 14, provided application be properly made for the same.

Forms of application, either for university or extra-mural students, may be obtained by writing to the Secretary, 14 Hanover Street, Edinburgh.'

TABLE I.—*The Approximate Cost of Curricula.*

	Diplomas.	Class Fees.	Examination Fees, etc.	Total.
1. TEACHING UNIVERSITIES.				
Edinburgh	M.B., Ch.B. . . .	£115 0	£23 2	£138 2
Glasgow	M.B., Ch.B. . . .	97 13	23 2	120 15
Aberdeen	M.B., Ch.B. . . .	90 0	23 2	113 2
Dublin	B.A., M.B., B.Ch., B.A.O.	207 12	27 0	234 12
Durham	M.B.	116 0	26 0	142 0
"	M.B., B.S.	116 0	31 0	147 0
Victoria University . .	M.B., Ch.B. . . .	138 6	17 0	155 6
Birmingham . . .	M.B., Ch.B. . . .	148 19	20 0	168 19
Oxford	B.A., B.M., B.Ch. . .	165 0	30 0	£165–£220
Cambridge . . .	M.B., B.C. . . .	150 0	20 0	£150–£200
Liverpool	M.B., Ch.B. . . .	125 0	15 0	£140 0
London	M.B., B.S. . . .	150 0	25 0	175 0
Sheffield	M.B., Ch.B. . . .	120 0	..	..
2. NON-TEACHING UNIVERSITY.				
Royal, Ireland . . .	M.B., B.Ch., B.A.O. .	£145 0	£17 0	£162 0
3. LICENSING BODIES.				
Conjoint Scottish Qualification	L.R.C.P.E., L.R.C.S.E., and L.F.P.S.Glasg.	£90 0	£30 0	£120 0
Conjoint English Qualification	L.R.C.P. Lond., and M.R.C.S. Eng.	£90–£120	42 0	£126–£156
Society of Apothecaries .	L.S.A.	£90 0	21 0	£105 0
Conjoint Irish Qualification	L.R.C.P.I., and L.R.C.S.I.	135 0	42 0	177 0
Apothecaries' Hall . .	L.A.H.	90 0	22 1	112 1

At University College, Bristol, the curriculum costs £139, 13s. For the London University degree, £25 will require to be added to cover the fees for classes necessary for the Preliminary Scientific Examination.

In Ireland, the Dublin University only confers the M.B., B.Ch., B.A.O. degree on Bachelors in Arts; the cost therefore is considerably higher than elsewhere. The expense incurred while working for the Irish diplomas comes to about £140 in Dublin, but is much less than this at any of the Queen's Colleges, whether at Belfast, Cork, or Galway. The degree of the Royal University of Ireland costs £165 at the Catholic University School of Medicine in Dublin; the diploma of the conjoint colleges, £166.

The fees for lectures and examinations, therefore, vary from about £115 to £200; and, adding the cost of books, instruments, and club subscriptions for the five years, say £30, and of maintenance during thirty-nine weeks each year, £300, we get a total expense, solely connected with the curriculum, of from £445 to £530. This estimate is the utmost minimum; in most cases a sum of £1000, or over it, will be spent in the five years.

II. THE REGULATIONS OF THE GENERAL MEDICAL COUNCIL, BINDING ON ALL THOSE ENTERING UPON THE FIVE YEARS' COURSE OF MEDICAL STUDY, CONSTITUTING THE MINIMUM COURSE ALLOWED FOR GRADUATION OR LICENCE.

A. *Preliminary Examination and Registration.*

Before registration as a medical student, from which the commencement of the five years' course is calculated, the student must be sixteen years old and pass a preliminary examination in the subjects of general education, or an examination recognised by the General Medical Council as equivalent to it. (Cf. Table II., pp. iv.–vii.)

In most cases a preliminary examination certificate is only accepted by the Council as entitling to registration, provided that it certifies that all the required subjects have been passed at one and the same time.

The student now enters his name on the books of a university or college, receives a certificate to this effect, and forwards the certificate, along with that for the preliminary examination, and a form of application for registration in the books of the General Medical Council (to be obtained from the registrars of the Council), filled up according to the instructions printed on it, to the registrar of the Branch Council for the district in which his school is situated. If this is not done within *fifteen days* from the commencement of a session, the classes taken during that session will not be recognised as qualifying for graduation. (For the names and addresses of the registrars, see p. xxiii.)

B. *Professional Education.*

The student is now officially recognised as having commenced the professional study of medicine, and is required to spend at least five years over it, of which the last year must be devoted to clinical work. Before he can enter for any of the examinations, he must produce certificates, not only to show that he has attended the necessary classes, and paid the necessary fees, but that he has given satisfaction to his teachers by his conduct, and taken part in the class examinations held during the sessions. The minimum attendance on classes which constitutes an *annus medicus* is fixed at two courses of lectures during each session, or one course of lectures and hospital practice.

Graduates in Arts or Science of any university recognised by the Medical Council, who shall have spent a year in the study of physics, chemistry, and biology, and have passed an examination in these subjects for the degrees in question, shall be held to have completed the first of the five years of medical study.

TABLE II.—*List of Examining Bodies whose Examinations in General Education are recognised by the Medical Council as qualifying for Registration as Medical or Dental Student.*

Testimonials of proficiency granted by educational bodies, according to the subjoined list, will be accepted by the Council, which reserves the right to add to or take from the list.

A Degree in Arts of any university of the United Kingdom, or of the colonies, or of such other universities as may be specially recognised from time to time by the Medical Council, is considered a sufficient testimonial of proficiency.

I. UNIVERSITIES IN THE UNITED KINGDOM.

Universities of Oxford, Cambridge, and Durham:—

(1) Junior Local Examinations (to include all the required subjects at one time).
(2) Senior Local Examinations (to include the required subjects).
(3) Responsions (certificate to be supplemented by others showing that the required mathematical subjects have been passed). Oxford.
(4) Moderations (to include the required subjects). Oxford.
(5) Final Examination for a Degree in Arts.
(6) Higher Local Examinations (to include the required subjects). Cambridge.
(7) Previous Examination (to include the required subjects). Cambridge.
(8) General Examination (to include the required subjects). Cambridge.
(9) Matriculation Examination in Arts for Graduation in Medicine, Letters, Music, and Science (to include the required subjects). Durham.

Universities of London, Birmingham, Liverpool, Leeds, and Wales, and Victoria University:

(10) Matriculation Examination (to include the required subjects).
(11) Final Examination for a Degree in Arts or Science. Birmingham also has 1, 2, 3, 7, *supra*.

Universities of Edinburgh, Aberdeen, Glasgow, and St. Andrews:

(12) Junior Local Examination (to include all the required subjects at one time). Edinburgh and Aberdeen.

(13) Senior Local Examination (to include the required subjects). Edinburgh and Aberdeen.
(14) Preliminary Examination for Graduation in Medicine and Surgery (to include the required subjects).
(15) Preliminary Examination for Graduation in Arts or Science (to include the required subjects).
(16) Final Examination for a Degree in Arts or Science.
(17) Final Examination for the Diploma of L.L.A. St. Andrews.

University of Dublin:
(18) Public Entrance Examination (to include the required subjects).
(19) Examination for the First, Second, Third, or Fourth Year in Arts (certificate to be signed in the approved form by the medical registrar of the university).
(20) Final Examination for a Degree in Arts.

Royal University of Ireland:
(21) Matriculation Examination (to include the required subjects).
(22) Final Examination for a Degree in Arts or Science.

Oxford and Cambridge Schools' Examination Board:
(23) Lower Certificate (to fulfil the Council's requirements).
(24) Higher Certificate (to include the required subjects).
(25) Leaving Certificate (subjects to be passed at one time).

II. MEDICAL LICENSING BODIES.

Royal Colleges of Physicians and Surgeons in Ireland:
(26) Preliminary Examination (to include all the required subjects at one time).

III. EDUCATIONAL BODIES OTHER THAN UNIVERSITIES.

College of Preceptors:
(27) Examination for a First-Class Certificate or Second-Class Certificate of First or Second Division (to include all the required subjects at one time).
(28) Preliminary Examination for Medical Students.

Scotch Education Department:
(29) Examination for Lower Grade Leaving Certificate (to include all the required subjects at one time).
(30) Examinations for Higher Grade and Honours Leaving Certificate (to include the required subjects).

Educational Institute of Scotland:
(31) Preliminary Medical Examination.

Intermediate Educational Board of Ireland:
(32) Middle Grade Examination (to include all the required subjects at one time).

(33) Senior Grade Examination (to include the required subjects).

Central Welsh Board:
(34) Senior Certificate Examination.

IV. INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

(Certificates to include all subjects at the same time.)

Universities of Punjab and Allahabad:
(35) Intermediate Examination in Arts.

Universities of Malta; Bombay; Madras; M'Gill College and Bishop's College, Montreal; Fredericton, New Brunswick; Toronto; Trinity and Victoria, Toronto; Queen's, Kingston; Western, Ontario; Mount Allison College, New Brunswick; King's College, Nova Scotia; Dalhousie, Halifax; Melbourne; Sydney; and Cape of Good Hope; and the Colleges of Quebec; Trinity, Toronto; Ontario; and New Brunswick:
(36) Matriculation Examination.

Ceylon Medical College; Universities of Manitoba, Otago, and New Zealand; and the Medical Boards of Nova Scotia and Newfoundland:
(37) Preliminary Examination.

Universities of Madras, Calcutta, Sydney, and Adelaide:
(38) First Examination in Arts.

Universities of Sydney, Adelaide, and Tasmania:
(39) Senior Public Examination.

Codrington College, Barbadoes:
(40) Arts Examinations at Durham University.

Continental Bodies:
(41) The German Abiturienten-Examen of the Gymnasia and Realgymnasia; Examinations entitling to the French Diplomas of Bachelier ès Lettres and Bachelier ès Sciences, and other corresponding Entrance Examinations to the Universities.

Egyptian Government:
(42) Secondary Education Certificate.

In the case of natives of India or other Oriental countries whose vernacular is other than English, an examination in a classic Oriental language may be accepted instead of an examination in Latin.

The Subjects in which Courses are required of all Candidates by the General Medical Council.

In every course of professional study and examinations, the following subjects must be contained:—

(1) Physics, (2) Chemistry, (3) Biology, (4) Anatomy, (5) Physiology, (6) Materia medica and pharmacy, (7) Pathology, (8) Therapeutics,

(9) Medicine, (10) Surgery, (11) Midwifery, (12) Vaccination, (13) Forensic medicine, (14) Hygiene, (15) Mental disease.

It is to be understood, as regards the above-mentioned subjects, that the Council offers no opinion as to the manner in which the subjects should be combined or distributed for purposes of teaching or examination.

Edinburgh University Medical Curriculum.—Under a new ordinance, which will come into operation in October 1907, the medical curriculum will undergo considerable modification. Henceforth the distribution of subjects among the professional examinations will be:—(1) Botany, Zoology, Physics, Chemistry; (2) Anatomy and Physiology; (3) Pathology and Materia Medica; (Final) Surgery and Clinical Surgery, Medicine and Clinical Medicine, Midwifery, Forensic Medicine, and Public Health. Moreover, most of these subjects may be taken separately, either immediately, or at a specified time after, the necessary qualifying course of lectures has been attended; this applies to the first, second, and third examinations, while the final may be taken in four parts, namely, Forensic Medicine and Public Health, Midwifery, Medicine and Surgery, and Clinical Medicine and Surgery. In order to admit of this arrangement, the professional examinations will in future be held more frequently, and the winter session has been divided into a first and second half. The first examinations under the new order take place on December 11–14, and comprise the first, second, third, and part of the final subjects. The chief additional alteration in the curriculum is the relegation of Materia Medica to the fourth winter, after Pathology has been studied. More time will also be available in the final year for clinical work.

TABLE III.—*Details of the Curriculum required by the various*

(Minimum Age in all, 21 years ;

	Length of Compulsory Study at Institution giving Degree.	Chemistry.	Practical Chemistry.	Botany.	Zoology.	Physics.	Practical Physics.	Anatomy.	Practical Anatomy.	Physiology.	Practical Physiology.	Practical Histology.	Materia Medica and Therapeutics.	Practical Pharmacy.	Pathology.	Practical Pathology.	Post mortems.
	SUBJECTS OF COURSES REQUIRED,																
SCOTLAND.	Years																
M.B., Ch.B. **Universities of** { **Edinburgh**, **Glasgow**, **Aberdeen**, **St. Andrews** }	2	6	3	3	3	3	..	6	12	6	3	..	6	25 mtgs. or 3 mths.	6	3	[illegible]
L.R.C.P. and L.R.C.S.Ed. ; and L.F.P.S.Glasg. ; and the Scotch Colleges . .	..	6	3	..	3	3	..	6	12	6	..	..	3	3	3	..	3
ENGLAND.																	
London University, M.B. . **" " B.S. .**	..	C.	C.	..	C.	C.	..	6	12	60 mtgs.	6	3	3	2	C.	..	C.
Durham University, M.B. . **" " B.S. .**	1	6	3	..	3	3	3	12	12	6	3	3	3	3	3	..	2 (cert.)
Victoria University, M.B. . **" " B.S. .**	2	6	3	..	4	6	3	6	15	6	C.	..	9	C.	6	C.	12
Birmingham University, M.B. **" " B.Ch.**	4	6	3	..	6	6	3		9	6	3	..	9	3	6	3	12 mths.
Universities of { **Oxford**[1] **Cambridge** } { **M.B. B.C.** }	{ 6 3 }	C.	C.	C.	C.	Course		C.	6	6	..	..	C.	C.	C.	..	C.
L.R.C.P.Lond. ; and M.R.C.S. Eng., London Colleges .	..	180 hrs.		..	120 hrs.	120 hrs.		6	12	C.	6		3	3	3		12
L.S.A. London, Society of Apothecaries . . .	..	6	3	..	3	..	..	6	12	6	..	3	6	3	3	..	C.
IRELAND.																	
Dublin University, B.A. M.B., B.Ch., B.A.O. . . .	4	6	3	3	3	C.	..	6	12	12	C.	3	3	..	6	3	[illegible]
Royal University, Dublin, M.B., B.Ch., B.A.O. . .	..	6	3	3	3	3		12	12	12	3	..	3	3	3	3	[illegible] (cert.)
L.R.C.P.I. and L.R.C.S.I., Irish Colleges . . .	..	6	3	..	3	3	..	6	12	6	..	3	3	3 or 3 yrs. apprentice.	..	..	30 mtgs.

Figures represent months unless

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[1] The Oxford degrees are only conferred on those holding the B.A. degree of the University ; the details of the

Universities and Licensing Bodies for Degrees or Diplomas.

length of Course, 5 years.)

WITH LENGTH OF ATTENDANCE.

Medical Jurisprudence and Public Health.		Medicine.	Clinical Medicine.	Surgery.	Clinical Surgery.	Operative Surgery.	Regional Anatomy.	Midwifery and Diseases of Women.	Diseases of Women.	Labour Cases, or Practical Midwifery.	Hospital Practice.	Dispensary.	Mental Diseases.	Infectious Diseases.	Ophthalmology.	Diseases of Children, or Laryngology.	Clerk and Dresser in Hospital.		Vaccination.
											Years.		Meetings.				Med.	Surg	
3		6	9	6	9	C.	..	6	..	12 cases or 3 mths. and 6 cases	3	6	16 16 C. C.	12 10 3 mths. C.	24 20 3 mths. C.	18 (optional) 3 mths.	6	6	Certificate.
3		6	0	6	9	..	..	3	..	20 cases or 3 mths. and 6 cases	2	6	13	13	13	..	Certificate.		
													Mths.	Months.	Months.				
C.	C.	C.	24	C.	24	.. C.	.. ..	C.	..	20 cases	4	6	2	2	C.	C.	Certificate.		
3	C.	12	18	12	18	.. C.	.. C.	3	..	20 "	4	..	3	20 cases	..	..	6	6	
3	3	12	24	6	24	.. 6	.. ..	6	3	20 "	2	..	C.	C.	..	..	6	6	
3	6	12	18	12	18	3	3	6	3	20 "	3	..	3	3	3	..	6	6	
C.	C.	6	C.	6	C.	C.	..	C.	..	20 "	3	..	C.	3	..	..	6	6	
3	3	6	9	6	9	C.	..	3	12 mtgs.	20 "	2	6	C.	C.	3	..	6	6	
3	3	6	9	6	9	C.	..	6	..	20 "	3	..	3	3	3		6	6	
											Mths.								
3	..	6	27	6	27	3	6	6	..	6 mths. 30 cases	27	..	3	C.	3	..	..	..	1
3	3	6	33	6	33	24 mtgs.	..	6	..	6 mths. 20 cases	33	..	3	10 cases and 3 mths.	3	..	3	3	10 mtgs.
3	..	6	27	6	27	30 mtgs.	..	6	..	6 mths. 30 cases	27	..	3	C.	3		..	..	Certificate.

otherwise stated. C. = Course

curriculum required differ in many respects from the others, and may be obtained from the University Authorities.

TABLE IV.—*Table of Universities, Medical Schools and Institutions, with the Dates for Preliminary Examinations and Sessions*, 1907–1908.

		Preliminary or Matriculation Examination.	Sessions.		
			Winter.	Spring.	Summer.
ENGLAND AND WALES.					
London University		Jan. | June. | Sept.	..	..	..
The Royal College of Physicians, London; and Surgeons, England		Oct. Jan. | April. July. | (Coll. of Preceptors.)	..	..	..
London Hospitals	Guy's	As in last two	Oct. 1.	..	Beginning of May.
	St. Bartholomew's		" "	..	"
	St. Mary's		" "	..	"
	Westminster		" "	..	"
	London		" "	..	"
	Middlesex		" "	..	"
	St. George's		" "	..	..
	Charing Cross		" "	..	"
	St. Thomas's		" "	..	"
	King's		" "	..	..
	University		" "	..	..
PROVINCIAL.					
Durham University		Sept., Jan., March.	" 1.	..	"
University of Liverpool		June and September.	" "	..	"
Victoria University, Manchester			" "	..	"
University of Birmingham		June and September.	" "	..	"
University College, Bristol			" "	..	"
University College, Sheffield			" "	..	"
University of Leeds		...	..	..	..
Universities of Wales	University College, Bangor	Local Examinations by College of Preceptors, etc.	" 2.	..	..
	" " Cardiff		" "	..	..
	" " Aberystwyth	..	" "	..	..
SCOTLAND.					
Universities of	Edinburgh	Sept. 27. | March 27.	Oct. 15.	..	May 1.
	Glasgow		" 17.	..	April 23.
	Aberdeen		" 14.	..	" 29.
	St. Andrews		" 15.	..	..
Edinburgh School of Medicine		Sept. 11. | March.	" 15.	..	May 1.
University College, Dundee		Sept. 25. | March.	" 14.	..	April 23.
St. Mungo's College, Glasgow		Sept., April, July.	" 17.	..	" "
Anderson's College, Glasgow			" 17.	..	" "
IRELAND.					
Dublin University		(B.A. Degree.)	" 1.	..	May 1.
Royal University of Ireland		Sept. | June.	..	..	..
Conjoint Colleges		" | March.	" 1.	..	April 1.
Catholic University		" | "	Nov.	..	..
Queen's Colleges	Galway	Oct., Nov. | ..	Oct. 18.	..	May 1.
	Cork	"	" 21.	..	" "
	Belfast	"	" 15.		" "

C. SINGLE QUALIFICATIONS NOT CONFERRING IN THEMSELVES THE RIGHT TO REGISTER.

Many of the colleges confer degrees or diplomas on members of the profession who already possess a registrable qualification. The M.B. of London and Durham Universities allows the holder to practise, while the examination for M.B. at Oxford and Cambridge is the same as that for B.C.

Owing to the limited space at our disposal, it is impossible to enter into any details as to the conditions under which these degrees and diplomas are given, especially as they appertain to graduates who hardly require information about them. All the universities confer degrees of Doctor of Medicine and Master in Surgery on their graduates, only imposing as a condition that a longer or shorter interval shall elapse between graduation and the grant of the higher degree. Generally, the candidate has to present an original essay or thesis, and in some instances to pass a clinical examination.

At Cambridge University the M.D. degree may be taken three years after M.B., B.C. two years after M.C. The London and Durham M.D. and M.S. are conferred on M.B. and B.S. graduates respectively, after two years have elapsed; the equivalent degrees of the Victoria University, after one year. At the Scotch Universities the degrees of M.D. or Ch.M. are granted after two years' practice or one year's hospital or research work, if the candidate be 24 years old. Both the Irish Universities require three years to elapse.

Royal Colleges.

The Royal College of Physicians of London grants the membership to university graduates or to its licentiates after an examination, fee £42. Recipients must have attained the age of 25 years. The Royal College of Surgeons of England grants its fellowships to persons of or above 25 years of age, who have been six years in practice, and who must pass the membership examination before the second examination for the higher degree. Fee, if a member, £15, 15s.; if not, £31, 10s. Similarly, the Scottish corporations grant single licences to persons of either sex who already hold a recognised qualification—the Royal College of Physicians, Edinburgh, to those with a surgical; the Royal College of Surgeons, Edinburgh, and the Faculty in Glasgow, to those with a medical qualification. The fee in each case is £15, 15s.

The Royal College of Physicians, Edinburgh, confers its membership on licentiates of the college, and graduates of universities of the United Kingdom, after attaining 24 years, on examination. Fee for licentiate, £15, 15s.; for others, £36, 15s. The fellowship is conferred by election on members, aged 27, of three years' standing. Fee, £64, 18s.

An examination is required of candidates for the Fellowship of the Royal College of Surgeons, who must be 25 years of age, and registered practitioners of two years' standing. Fee for licentiates, £30; for others, £45. Similar regulations apply to the Fellowship of the Faculty of Physicians and Surgeons of Glasgow, but 24 is the minimum age. The fees are different, if the candidate desires to qualify for holding office or not; £50 or £30 for non-licentiates, £15 or £25 for licentiates.

The Royal College of Physicians of Ireland grants licences in medicine and in midwifery to registered practitioners, a membership diploma to licentiates 25 years of age, of three years' standing, and to practitioners of seven years' standing or University B.A.s., after one year's possession of the licence. Fee, £21 (£15, 15s. to graduates in Arts).

The Royal College of Surgeons in Ireland retains the right of deciding whether candidates for the Fellowship shall be admitted to examination or not. Licentiates or graduates in surgery of less than ten years' standing have to pass two examinations; fees, £26, 5s. for licentiates of the college, £42 for others. When of more than two years' standing they have only one examination; fees, £26, 5s. and £42, as before.

Further information with regard to these qualifications can be obtained from the secretaries of the different colleges. A list containing their names and addresses will be found below (p. xxii.).

POST-GRADUATE COURSES.

In London, Glasgow, Dublin, and Cambridge, regular post-graduate classes are held.

In Edinburgh organised post-graduate instruction, which had fallen into abeyance for several years, was revived in 1906, and annual courses are now given in the month of September. These courses are so arranged as to occupy two consecutive periods of a fortnight each, and although each is complete in itself, the second is complimentary to the first, so that both may be attended with advantage by those who can spare the necessary time. The lectures and demonstrations cover a large variety of subjects, and a carefully drawn up time-table prevents clashing as far as is possible. For syllabus and particulars as to fees, apply to the Hon. Sec., Dr. Edwin Bramwell, 23 Drumsheugh Gardens. Arrangements are also being made to facilitate advanced post-graduate work throughout the year.

Fourteen of the London general and special hospitals have lately combined in a scheme for the better provision of post-graduate clinical teaching; a fee of £10, 10s. or of £15, 15s., enabling practitioners to attend the clinical instruction, the operations and autopsies, for three or six months respectively, at any one of these hospitals. The autumn session commenced on 1st September. Further information may be obtained from the Secretary, London Post-Graduate Association, Examination Hall, Victoria Embankment.

In May 1899, a London Medical Graduates College and Polyclinic was opened at 22 Chenies Street, Gower Street, W.C., at which consultations in various branches of medicine and surgery are held daily, except on Saturdays; clinical lectures are given, and practical classes conducted. An annual subscription of £1, 1s. admits the subscriber to the consultations and lectures. The fees for special courses vary from £1, 1s. to £5, 5s. Other institutions of a similar nature in London are the West London Post-Graduates College (Dean, Mr. L. A. Bidwell, West London Hospital, Hammersmith), which is said to be well adapted to the needs of naval and army surgeons, and the North-East London Post-Graduate College (Dean, Dr. A. J. Whiting, 142 Harley Street, W.), at which the course for the M.D. (Lond.) may be taken. Session begins October 20th.

Both in London and Liverpool Schools of Tropical Medicine have been established, at which graduates can study at first hand the diseases special to tropical countries. The London School commences the first of these annual courses on 1st October.

At Charing Cross Hospital special series of clinical lectures and practical demonstrations, exclusively arranged for the convenience of practitioners and post-graduate students, are given by members of the staff throughout the year. The lectures for the year are arranged in three courses, each consisting of ten meetings, and lasting ten weeks.

In Cambridge, graduates of other universities are admitted as advanced students. They may for one or more terms pursue courses of advanced study or research, literary or scientific, under the direction of the University teachers, and may become members of certain colleges without fulfilling the same conditions as are imposed on junior students, their collegiate status being assimilated to that of students who have taken their first degree in the university.

In Glasgow the course begins in September, and consists of a series of 120 meetings in various departments of medicine. The Secretary is Dr. Maxtone Thom, Royal Infirmary.

THE MEDICAL EDUCATION OF WOMEN.

A number of qualifications are now open to men and women alike. The degrees of the English Universities, except Oxford and Cambridge, of the Royal University of Ireland, and of the four Scotch Universities, may be conferred on women; who also may be granted the conjoint diplomas of the Scotch and Irish Boards, and the licence of the Society of Apothecaries, London.

The conditions for the qualification of women are practically the same as those for men. The University of Edinburgh, however, does not recognise attendance on mixed classes without sufficient reason shown.

The secretaries of the different schools, from whom prospectuses and any information required may be obtained, are as follows:—

London School of Medicine for Women—Miss Douie, 8 Hunter Street, Brunswick Square, W.C.

Newcastle School of Medicine (Durham University)—Secretary, Durham University.

Medical College for Women, Minto House, Edinburgh—The Secretary.
Queen Margaret's College, Glasgow—Miss Galloway.
Royal College of Surgeons, Ireland (rooms in connection with the college are set apart for the use of female students)—I. F. Blake, Registrar.

The tables given below show the different degrees and diplomas open to women, the recognised schools, and the approximate cost of the class and college fees.

TABLE V.—*Degrees and Diplomas open to Women.*

University Degrees.	Diplomas.
London. Durham. Birmingham. Sheffield. University College of S. Wales. The Royal, Ireland. The Four Scotch Universities. University College, Bristol.	1. *Conferring Qualification to Practise.* The Triple Qualification of the Royal Colleges, Scotland. The Conjoint Qualification of the Royal Colleges, Ireland. The Society of Apothecaries, London. 2. *Not conferring Qualification.* Licence of the Royal College of Surgeons, Edinburgh.

With the exception of two of the Scottish Universities, all these qualifications are given on the same conditions as to men. At Edinburgh and Glasgow Universities the compulsory two years' residence is allowed to be represented by residence at a recognised School for the Medical Teaching of Women.

TABLE VI.—*Medical Schools for Women.*

Name.	Cost of Curriculum and Fees.
London School of Medicine for Women, Brunswick Square	£125
College of Medicine, Newcastle-on-Tyne .	£146
Scottish Association, Edinburgh (qualifies for Edinburgh University)	(University), £128, 7s. (Colleges), £130
Queen Margaret College, Glasgow (qualifies for Glasgow University)	£129
Schools of Surgery of the Royal College of Surgeons, Ireland	(For College Degree), £165–£172.
Aberdeen and St. Andrews Universities (only first two years at St. Andrews).	
Dundee University College.	
Queen's College, Galway.	
Universities of Sheffield and Bristol.	

PUBLIC HEALTH.

The Local Government Act, passed in 1888, provides that all medical officers of health of counties or districts with a population of 50,000 or more, must possess a diploma in public health, or must have been a medical officer of a district with 20,000 inhabitants for three consecutive years before 1892; or, before the passing of the aforesaid Act, have been for not less than three years a medical officer or inspector under the Local Government Board.

Qualifications in public health (sanitary science, sanitary medicine, State medicine) are therefore much more sought after than formerly. They do not carry a right to register, and are only conferred on candidates already possessed of a registrable qualification.

Certain regulations for candidates for diplomas in public health, designed to ensure "the possession of a distinctly high proficiency, scientific and practical, in all the branches of study which concern the public health," have been laid down by the General Medical Council. The Council now recommends the following rules to be observed:—

1. A period of not less than twelve months shall elapse between the attainment of a registrable qualification in medicine, surgery, and midwifery, and the admission of the candidate to any examination or any part thereof for a diploma in sanitary science, public health, or State medicine.

2. Every candidate shall produce evidence of having, after obtaining a registrable qualification, attended during six months, practical instruction in a laboratory or laboratories, British or foreign, approved of by the body granting the diploma, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught.

3. Every candidate shall produce evidence that, during a period of six months after obtaining a registrable qualification, he has practically studied the duties of outdoor sanitary work under a medical officer of health, who is also a recognised teacher, or—(*a*) In England and Wales, under the medical officer of health of a county, or of a single sanitary district having a population of not less than 50,000; or (*b*) in Scotland or Ireland, under the medical officer of health of a county, or of one or more sanitary districts having at the date of the last census a population of not less than 30,000; or (*c*) under a Sanitary Staff Officer of the R.A.M.C. having charge of an army corps, district, or command recognised by the General Medical Council. The six months may be reduced to three, if a three months' recognised course of Sanitary Law and Engineering, Vital Statistics, etc., has been attended.

⁂ Any candidate who shall produce evidence that he has himself held an appointment of medical officer of health, under conditions not requiring the possession of a special sanitary diploma, shall be exempt from this regulation.

4. Every candidate shall produce evidence that he has attended the clinical practice for three months of a hospital for infectious diseases, at which opportunities are afforded for the study of methods of administration.

5. The examination shall be conducted by Examiners specially qualified, and shall include laboratory work.

⁂ The rules as to study shall not apply to medical practitioners registered, or entitled to be registered, on or before 1st January 1890.

Degrees and Diplomas.

DEGREES (FOR UNIVERSITY GRADUATES IN MEDICINE).

M.D. (State Medicine), London. (Two years' study required.)

B.Hy., Durham. (Three months' course in comparative pathology (lectures), etc.; must study at Newcastle School of Medicine.)

B.Sc., Birmingham. (Six months' laboratory course of hygienic chemistry; a course of bacteriology; six months' practical outdoor experience; attendance upon a fever hospital.)

B.Sc., Edinburgh. (Eight months' laboratory (five at Edinburgh University) courses in physics, geology, public health, sanitary engineering, and in mensuration and drawing required, as well as official regulations.)

D.Hy., Durham. (Earliest date, two years after B.Hy., spent as M.O.H. Essay sent in.)

D.Sc., Edinburgh. (Five years after B.Sc., Thesis and Examination.)

B.Sc., Victoria University, Manchester (three years' study required).

DIPLOMAS.

D.P.H.
- Durham University. (Regulations as for B.Hy., but need not be a University graduate, nor have studied at Newcastle.)
- Oxford University. (Must fulfil General Medical Council's conditions.)
- Cambridge University. (Do.)
- Victoria University. (Do.)
- Aberdeen University. (Fever hospital course, six months; if not M.B.Aberd., must attend some of the necessary classes.)
- Birmingham University. (As at Oxford.)
- Leeds University. (Do.)
- Royal Colleges, London. (Do.)
- Royal Colleges, Edinburgh and Glasgow. (Do.)
- Sheffield University. (Do.)
- Liverpool University. (Do.)

D.S.M., Dublin University. (Must be a graduate of the Universities of Dublin, Oxford, or Cambridge, or M.D.)

,, Royal Colleges, Ireland. (As at Oxford.)

D.S.Sc., Royal University, Ireland. (Only conferred on graduates of the University. Cf. Calendar.

Medical practitioners who registered or were entitled to register before 1st January 1890 are admitted to the examination for the Durham D.P.H., under the same conditions as are noted above. Twenty-eight days' notice is required. Fee, £10, 10s. At Oxford and Cambridge Universities the diplomas in public health are granted to any registered person who, if he qualified before 1st January 1890, is not required to pursue a prescribed course of study. Similar regulations govern the examinations of the different colleges in the case of those who qualified prior to 1890.

The actual scope of the examinations as held at the different centres can be easily ascertained from the syllabuses and calendars to be obtained from the secretaries. The titles of the books best adapted for perusal in view of the examinations may be seen in the *British Medical Journal* for September 3, 1904.

Fees for examinations.—D.P.H.—£12, 12s., English and Scottish Colleges: £10, 10s., Irish Colleges; Durham, St. Andrews, and Victoria Universities: £5, London and Royal Irish Universities: £5, 5s., Aberdeen: £10, Oxford: £12, 12s., Cambridge: £10, Birmingham.

B.Sc.—£6, 6s., Edinburgh; £10, Birmingham.

B.Hy.—£16, 16s., Durham.

Usual fee for six months' laboratory work, £10, 10s. to £21.

Institutions at which Laboratory Work and Classes for Public Health Curriculum can be taken.

LONDON.

St. Bartholomew's Hospital.—Inclusive fee, 20 guineas.

Charing Cross Hospital.—Inclusive fee, 20 guineas.

St. George's Hospital.—Inclusive fee, 20 guineas; for candidates registered before 1st January 1890, 12 guineas.

Guy's Hospital.—Inclusive fee for six months' course of laboratory instruction and lectures, 20 guineas.

King's College.—Fee includes all course necessary.

London Hospital.—Inclusive fee, 20 guineas; three months' course, 12 guineas.

St. Mary's Hospital.—Six months' course, inclusive fee, 12 guineas.

St. Thomas's Hospital.—Inclusive fee, 20 guineas; short course, 6 guineas.

University College.

Middlesex Hospital.

PROVINCIAL.

Cambridge University.

Birmingham University.—Inclusive fee, 13 guineas.

University of Liverpool.

University of Leeds.

University of Durham, College of Medicine, Newcastle-on-Tyne.

University College, Bristol.

Victoria University, Manchester.

IRELAND.

School of Physic, Dublin.

The Catholic University School of Medicine.

Royal College of Surgeons, Schools of Surgery, Dublin.

SCOTLAND.

University of Edinburgh.—Fees, winter session, 10 guineas; summer session, 6 guineas.

University of Glasgow.—Fee for course of instruction, 10 guineas.

University of Aberdeen.—Fee for course of instruction, 9 guineas.

St. Mungo's College, Glasgow.—Fees: winter session of lectures and six months' laboratory instruction, 12 guineas; summer session of lectures and three months' laboratory instruction, 6 guineas.

The Conjoint Board in Scotland.—Fee for six months' laboratory course, 18 guineas.

CLINICAL HOSPITALS.

There are a number of hospitals throughout the kingdom which may be attended for the purpose of clinical study, especially during the fifth year of the curriculum, and attendance at which is accepted by many of the licensing boards as part of the compulsory period for hospital work.

In *London*, in addition to the clinical hospitals attached to the medical schools, the conjoint board of the Royal Colleges of Physicians and Surgeons accept certificates of attendance during the fifth year of study, from the—Great Northern Central Hospital, 155 beds; West London Hospital, 175 beds, Fee, 5 guineas; The Hospital for Sick Children, Great Ormond Street, 222 beds, Fee, £3, 3s. for three months, £5, 5s. perpetual ticket; East London Hospital for Children, 100 beds, Fee, 4 guineas; Royal London Ophthalmic Hospital, 100 beds, Fee, 5 guineas; Hospital for Consumption, Brompton, 321 beds, Fee, 8 guineas; City of London Hospital for Diseases of the Chest, 164 beds; National Hospital for the Paralysed, etc., Queen Square, 200 beds; Queen Charlotte's Lying-in Hospital, 1100 patients annually, Fee, 8 guineas for four weeks.

Fever hospitals and asylums.—The Metropolitan Fever Hospitals, Fee, £3, 3s., two months, £1, 1s. each additional month; Bethlem Royal Hospital, Lower Hall Asylum, Bow; Camberwell House Asylum, Bethnal.

THE PROVINCES.

Liverpool—Royal Southern, 200 beds, Fee, £26, 5s.[1]; Northern, 155 beds, Fee, £26, 5s.[1]; Eye and Ear Infirmary, Myrtle Street, 46 beds; Infirmary for Children, 88 beds, free.

Manchester—St. Mary's Hospital for Diseases of Women and Children, 55 beds, 3400 labours, Fee for necessary course, £2, 2s.

Newcastle-on-Tyne—Hospital for Sick Children, 60 beds, free.

Bath—Royal United Hospital, 130 beds.

Birmingham—Midland Hospital for Skin and Urinary Diseases, £5, 5s. for three months.

Bradford—Royal Infirmary, 230 beds, £10, 10s.[1]

Brighton—Sussex County Hospital, 190 beds, £21 for two years.

Derby—Derbyshire Royal Infirmary, 198 beds, £10, 10s. annually.

Devonport—Royal Albert Hospital, 88 beds, £2, 2s.

Hospitals in *Exeter*, *Gloucester*, £20 a year; *Lincoln*, £10, 10s.; *Norwich*, £15, 15s.; *Nottingham*, £10, 10s.; *Staffordshire*, £10, 10s.; *Winchester*, £21[1]; *Wolverhampton*, £21.[1]

SCOTLAND.

Edinburgh—Royal Infirmary, 790 beds, £12[1]; Victoria Hospital for Consumption, 15 beds, £2, 2s. for course; Royal Hospital for Sick Children, 119 beds, £2, 2s. for course; Eye, Ear, and Throat Infirmary, 6 beds, £1, 1s.; Royal Maternity, 40 beds, £2, 2s.; City Hospital for Infectious Diseases, 400 beds, £2, 2s.; Royal Asylum, Morningside, 700 beds, £2, 2s.

Glasgow—Royal Hospital for Sick Children, 80 beds, £1, 1s.; Western Infirmary; 400 beds, £21[1]; Eye Infirmary, £1, 1s.; Royal Infirmary, £21[1]; Maternity; Belvedere Fever Hospital; Lock Hospital.

Dundee—Royal Infirmary, 286 beds; Royal Asylum.

Aberdeen—Royal Infirmary, Fee, £6; Sick Children's Hospital.

IRELAND.

Dublin—Sir Patrick Dun's Hospital, £12, 12s.[1]; Richmond, Whitworth, and Hardwicke Hospitals,[2] 312 beds; Richmond Asylum, 1200 beds; Adelaide Hospitals, 140 beds; City of Dublin Hospital; Jervis Street Hospital, £12, 12s. a year; Mater Misericordiæ Hospital,[2] 323 beds; Dr. Steeven's Hospital,[2] 200 beds, £10, 10s., three months; St. Vincent's Hospital, 160 beds; Meath Hospital,[2] 160 beds; Rotunda Hospital, 1700 labours intern, 1800 extern annually—Fee, for term, six months, £21, three months, £12, 12s., Extras, £10, 10s. and £6, 6s., Cork Street Fever Hospital; Coombe Lying-in Hospital.

Belfast—The Royal, £20[1]; Maternity; Ophthalmic; Eye, Ear, and Throat Hospitals; and those for Diseases of Women, for Sick Children, and the District Asylum.

Cork—North (100 beds) and South (100 beds) Infirmaries; the Mercy, Cork Union, Lying-in, Maternity, Fever, Gynecological, and Ophthalmic and Aural Hospitals; and the Eglinton Asylum.

Galway—County Infirmary and Lower Hospital.

DENTAL SURGERY.

Licences to practise dentistry and to be registered are obtainable from the Royal College of Surgeons of England, of Edinburgh, and of Ireland, and from the Faculty of Physicians and Surgeons of Glasgow.

A large number of the medical teaching institutions provide special arrangements for dental students. A list of the majority of these is given on page xxii.

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[1] Perpetual.

[2] Contain beds for Fever patients.

Regulations of the General Medical Council.

Candidates for a diploma in dental surgery shall produce certificates of having been engaged during four years in professional studies, and of having received three years' instruction in mechanical dentistry from a registered practitioner. One year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted one of the four years of professional study. The three years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student, either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

A register of dental students is kept by the Registrar of the General Medical Council, 299 Oxford Street, London.

Preliminary education.—Dental students are subject to the same regulations as regards preliminary education as medical students, but professional study may commence by pupilage with a registered dental practitioner.

The Royal College of Surgeons of England.

Licence in Dental Surgery.

The following are the regulations:—

I. There is a Preliminary Science Examination and two Professional Examinations for the licence. The Preliminary Science Examination consists of chemistry, physics, and practical chemistry, and is identical with Part I. of the First Examination of the Examining Board in England for medicine. The First Professional Examination for the licence consists of mechanical dentistry and dental metallurgy; and the Second, general anatomy and physiology, general surgery and pathology, dental anatomy and physiology, dental pathology and surgery, and practical dental surgery.

Candidates will be required to show a general knowledge of the anatomy of the whole human body.

II. Candidates will be required to produce certificates of having received instruction, at an institution recognised for the purpose, in chemistry, physics, and practical chemistry, before entering for the Preliminary Science Examination.

⁂ This instruction may be taken prior to the date of registration as a dental student.

III. Candidates will be required to produce the following certificates before entering for the First Professional Examination, namely:—

1. Of having been engaged, during a period of not less than three years, in acquiring a practical familiarity with the details of mechanical dentistry, under the instruction of a competent practitioner, or under the direction of the superintendent of the mechanical department of a recognised dental hospital, where the arrangements for teaching mechanical dentistry are satisfactory to the Board of Examiners in Dental Surgery. In the case of qualified surgeons, evidence of a period of not less than two instead of three years of such instruction will be sufficient.

⁂ This instruction may be taken prior to the date of registration as a dental student.

2. Of registration as a dental student by the General Medical Council.

3. Of having attended at a recognised dental hospital and school:

(a) A course of lectures on dental metallurgy.

(b) A course of practical dental metallurgy.

(c) A course of lectures on dental mechanics.

(d) A course of practical dental mechanics, including the manufacture and adjustment of six dentures and six crowns.

IV. Candidates will be required to produce the following certificates before entering for the Second Professional Examination, namely:—

1. Of having been engaged during four years in the acquirement of professional knowledge, subsequently to the date of registration as a dental student.

2. Of having attended at a recognised dental hospital and school:

(a) A course of dental anatomy and physiology.

(b) A separate course of dental histology, including the preparation of microscopical sections.

(c) A course of dental surgery.

(d) A separate course of practical dental surgery.

(e) A course of not less than five lectures on the surgery of the mouth.*

(f) A course of dental bacteriology.

(g) A course of dental materia medica.

* These lectures may be given either at a recognised dental hospital and school, in which case the lecturer must be a qualified surgeon practising surgery, or they may be given at a recognised medical school, and may form part of the course required by Clause 8 (d).

3. Of having attended at a recognised dental hospital or in the dental department of a recognised general hospital, the practice of dental surgery during two years.

4. Of having attended at a recognised medical school:

(a) A course of lectures on anatomy.

(b) A course of lectures on physiology.

(c) A separate practical course of physiology.

(d) A course of lectures on surgery.

(e) A course of lectures on medicine.

5. Of having performed dissections at a recognised medical school during not less than twelve months.

6. Of having attended at a recognised hospital or hospitals, the practice of surgery and clinical lectures on surgery during two winter sessions.

7. Of being 21 years of age.

⁂ The certificates of professional study will be required to show that students have attended the courses of professional study to the satisfaction of their teachers.

V. Candidates may present themselves for the Preliminary Science Examination before entering at a dental school, on production of the certificates required under Section II. This examination will be identical with Part I. of the First Examination of the Examining Board in England.

VI. Candidates may present themselves for the First Professional Examination for the licence after the completion of six months' attendance at a recognised dental hospital and school, on production of the certificates required under Section III.

VII. Candidates may present themselves for the Second Professional Examination, on production of the certificates required under Section IV., after the completion of four years' professional study from the date of registration as a dental student, and after the lapse of not less than six months from the date of passing the First Professional Examination.

VIII. Synopses of the examination in chemistry, physics, and practical chemistry, and dental metallurgy, are issued with the regulations.

IX. The Preliminary Science Examination will be held in January, March or April, July and October in each year.

The First and Second Professional Examinations will be held in May and November in each year. Candidates are required to give twenty-one clear days' notice of their intention to present themselves for examination.

Special Exemptions.

A candidate who shall produce satisfactory evidence of having passed an examination for a degree in medicine, conducted at a university in the United Kingdom, in India, or in a British colony, on the subjects of the Preliminary Science Examination, will be exempt from that examination.

Candidates who have passed the Second Examination of the Examining Board in England, or who shall produce evidence of having passed the examination in anatomy and physiology required for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in anatomy and physiology required for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in those subjects.

Candidates who are members of the college, or who have passed the examination in surgery of the Examining Board in England, or who shall produce evidence of having passed the examination in surgery for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in surgery for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in general surgery and pathology.

Fees to be paid by candidates, £21.

THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Licence in Dental Surgery.

The candidate must fulfil the conditions of the regulations of the General Medical Council (see above); and the regulations as to curriculum are generally the same as those of the Royal College of Surgeons of England.

Special Exceptions.

Candidates who have passed the corresponding examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the

Final Dental Examination or to the Final Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are licentiates of this college, or who may be registered medical practitioners, will require to produce certificates of attendance on the special subjects only, and will be examined in these only for the dental diploma. Any candidates who shall produce satisfactory evidence of having passed in any of the subjects of the First Dental Examination, before any dental or surgical licensing board recognised by the Royal College of Surgeons of Edinburgh, will be exempt from examination in such subject or subjects; but no examination will be recognised as giving exemption, unless it is coextensive in its scope with the examinations of this college, and is the only final examination on the subject or subjects required by the board at which it was passed.

Fees.—The fee for the diploma is £10, 10s. to those who began their studies before 1st October 1896; £15, 15s. to those who began after that date.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The regulations as to certificates, curriculum, number of examinations, fees, and examinations are in effect similar to those of the Royal College of Surgeons of Edinburgh. There is special provision for candidates who intend to qualify both under the Medical and Dentists Act, and there is an examination in practical dentistry conducted in a dental hospital, and also a practical examination in mechanical dentistry.

THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

Licence in Dentistry.

Candidates are required to pass three examinations, namely, Preliminary (in general education), Primary Dental, and Final Dental.

DENTAL TEACHING INSTITUTIONS.

London.

Royal Dental Hospital of London and School of Dental Surgery, Leicester Square. Fee, £53, 3s. in one payment; or £55, 13s. in two instalments. Mechanical Dentistry and Hospital Practice, £150.

National Dental Hospital or College, Great Portland Street, W. Fee for necessary course, £42. Mechanical Dentistry and Hospital Practice, £120.

Guy's Hospital and London Hospital.

Provinces.

University of Birmingham. Composition fee, £73, 2s.

University of Liverpool.

University College, Bristol.

Durham University and Newcastle School of Medicine.

University College, Bristol.

University of Manchester. Composition fee for degree, 60 guineas; for diploma, 55 guineas.

Devon and Exeter Dental Hospital, Exeter.

University of Leeds.

Scotland.

Incorporated Edinburgh Dental Hospital and School. Minimum fee, £90, 7s.

Dental Hospital and School, Glasgow.

Dental Department, Royal Glasgow Infirmary.

Anderson's College, Glasgow.

Ireland.

School of the Royal College of Surgeons, Ireland.

Special composition fees are charged at several of the London hospitals for the classes required by dental students apart from those taken at a dental hospital. Thus, Charing Cross and Middlesex Hospitals, £56, 14s.; Westminster Hospital, £50; St. Thomas's, £65; St. George's, £50; King's College, hospital fee, two years, £25, 4s.; lectures, £15, 15s.

NAMES AND ADDRESSES OF THE SECRETARIES AND REGISTRARS OF CERTAIN OF THE MEDICAL SCHOOLS.

I. *Branch Registrars of the General Medical Council.*

England—Mr. H. E. Allen, B.A., LL.B., 299 Oxford Street, London, W.

Scotland—Mr. James Robertson, 54 George Square, Edinburgh.

Ireland—Mr. Richard J. E. Roe, 35 Dawson Street, Dublin.

II. *Secretaries and Registrars, etc., of Medical Bodies.*

The Secretary—English Conjoint Board, Victoria Embankment, London, W.C.

The Secretary—Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.

The Secretary—Apothecaries' Hall, Blackfriars, London, E.C.

The Secretary—University of Durham, College of Medicine, Newcastle-on-Tyne.

The Secretary—Royal College of Physicians, Edinburgh.

The Secretary—School of Medicine of the Royal Colleges, Edinburgh, 24 Forrest Road, Edinburgh.

The Secretary—Royal College of Surgeons, Edinburgh.

The Secretary—Anderson's College Medical School, Glasgow.

The Secretary—Educational Institute of Scotland, 40 Princes Street, Edinburgh.

The Secretary—Royal University of Ireland, Dublin.

The Registrar—Royal College of Physicians, Pall Mall East, London, S.W.

The Registrar—University of London, Burlington Gardens, London, W.

The Secretary—University of Birmingham.

The Dean of the Faculty of Medicine—In each of the Scotch Universities.

The Dean of the Faculty of Medicine—Victoria University, Owens College, Manchester.

The Secretary—Irish Conjoint Board, 6 Kildare Street, Dublin.

III. *Inspectors of Conjoint Examination in Scotland.*

Mr. James Robertson, 54 George Square, Edinburgh.
Mr. Alexander Duncan, B.A., 242 St. Vincent Street, Glasgow.

ARMY MEDICAL DEPARTMENT.

WAR OFFICE, LONDON.

Schedule of Qualifications necessary for Candidates desirous of obtaining Commissions in the Royal Army Medical Corps, with the Conditions of Service.

QUALIFICATIONS.

1. A candidate for a commission in the R.A.M.C. must be 21 years and not over 28 years of age at the date of commencement of the entrance examination. He will be required to complete the following forms:—

1. Name in full.
2. Address.
3. Date of birth.
4. Registrable qualifications.
5. Academic or other distinction.
6. Name of Dean or other responsible authority of the school in which the candidate completed his course as a medical student.
7. Particulars of any commission or appointment held in the public services.
8. Date of examination at which the candidate proposes to present himself.

[*N.B.*—Misstatements invalidate subsequent appointments, etc.]

The Dean of the candidate's medical school will be requested to furnish a confidential report anent the candidate—his character, conduct, ability, and fitness. If approved by the Director-General, he will then be allowed to compete; first being examined by a board of medical officers.

The medical examination includes height, weight, chest measurement, eyesight, hearing, speech, condition of teeth, of heart and lungs, rupture, varicocele, varicose veins, development of limbs, of feet and toes, of skin, congenital malformations, and constitution. If there is any doubt, the Board have to state whether candidate, in their opinion, is of pure European descent.

The Secretary of State reserves the right of rejecting any candidate who may show a deficiency in his general education, as evinced by bad spelling or composition.

An entrance fee of £1 is required from each candidate admitted to the competition, and is payable at the conclusion of his physical examination, if pronounced fit.

A candidate successful at the entrance examination will be appointed a lieutenant on probation, and will be required to pass through such courses of instruction as the Secretary of State shall decide, and, after passing the examinations in the subjects taught, and satisfying the Director-General that he possesses the necessary skill, knowledge, and character for permanent appointment to the Royal Army Medical Corps, his commission as lieutenant will be confirmed. The commission shall bear the date of the officer's appointment as lieutenant on probation.

Before the commission as a lieutenant on probation is confirmed, he must be registered under the Medical Acts in force in the United Kingdom at the time of his appointment.

The precedence of lieutenants among each other shall be in order of merit, as determined by the combined results of the entrance examination and the examinations undergone while on probation; or in the case of an officer seconded to hold a resident hospital appointment, by the result of the entrance examination only.

Lieutenants, when appointed on probation, will receive instructions as to the provision of uniform.

EXAMINATIONS.

Subjects for the Entrance Examination.

Candidates will be examined by the Examining Board in medicine and surgery. The examination will be of a clinical and practical character, partly written and partly oral, marks being allotted under the following scheme:—

	Maximum Marks.
MEDICINE (WRITTEN).	
A. Examination and report upon a medical case	125
B. Commentary upon a case in medicine	100
(Three hours allowed for A and B together.)	
MEDICINE (ORAL).	
A. Clinical cases	100
B. Medical pathology	75
(One quarter of an hour allowed for each table.	
SURGERY (WRITTEN).	
A. Examination and report upon a surgical case	100
B. Commentary upon a case in surgery	125
(Three hours allowed for A and B together.)	
SURGERY (ORAL).	
A. Clinical surgery and pathology, including diseases of the eye; surgical instruments and appliances	75
(Twenty minutes.)	
B. Operative surgery and bandaging	100
(Thirty minutes.)	
Total marks	800

The following headings are published as a guide to candidates in drawing up their reports on cases:—

(a) A brief history of the case as given by the patient, including such points only (if any) in the family or personal history as have a distinct bearing upon the present illness or incapacity. (b) A detailed account of the subjective symptoms and physical signs elicited by the candidate's personal examination of the patient, noting the absence of any which might be expected to be present in a similar case. (c) Where there is any reasonable doubt in the mind of the candidate as to an exact diagnosis, he is to give the alternatives, with his reasons for making the selection. (d) A commentary upon the case as a whole, pointing out the symptoms which may be considered typical, and those which appear to be unusual or only accidental complications. (e) Suggestions as to treatment, both immediate and possibly necessary at a later date. (f) A forecast of the progress and probable termination of the case. Similarly, the commentary on the report of a case submitted to the candidate should discuss—(a) The family and personal history and other conditions preceding the development of the condition described. (b) The relative significance of the physical signs, symptoms, other indications of disease noted, and the general clinical aspects of the case. (c) The diagnosis, with reasons for selection of the most probable, when a positive diagnosis cannot be attained. (d) The treatment, dietetic, medicinal, operative, etc., including a criticism of the plan adopted, and alternative schemes of treatment in case of disagreement. (e) The morbid appearances and an account of the post-mortem examination (if any).

The examination will be held in London, and will occupy about four days.

The appointments will be filled up from the list of qualified candidates, arranged in the order of merit, as determined by the total marks each has obtained. Having gained a place in this entrance examination, the successful candidates will proceed to the Royal Army Medical College for instruction in recruiting duties, and then to Aldershot for two months' instruction in the technical duties of the corps, and at the end of the course will be examined on the subjects taught. They then undergo two months' instruction in hygiene, pathology, tropical medicine, military surgery, and military medical administration, after which they will be examined on these subjects. A lieutenant on probation who fails to qualify in either of these examinations will be allowed a second trial, and, should he qualify, will be placed at the bottom of the list. Should he again fail in either examination, his commission will not be confirmed.

Extracts from the Royal Warrant for Pay and Promotion, 1894, *as amended by Royal Warrant of* 18*th September* 1894, *and from the Regulations for Army Medical Services,* 1902.

PAY.

The pay of the officers of the R.A.M.C. shall be at the following rates:—

AT HEADQUARTERS.	Inclusive of all Allowances except Field and Travelling Allowances (Yearly).
Director-general	£2000 0 0
Deputy director-general	1500 0 0
Assistant director-general	850 0 0
Deputy assistant director-general	750 0 0

At Other Stations.

	Excl. of Allowances (Daily).
Surgeon-general	£3 0 0
Colonel	2 0 0
Lieutenant-colonel	1 10 0
Lieutenant-colonel specially selected for increased pay after at least 8 years' service abroad	1 15 0
Major	1 3 6
After 3 years as such	1 6 0
Captain	0 15 6
After 7 years' total full-pay service	0 17 0
,, 10 years' total full-pay service	1 1 0
Lieutenant on probation and lieutenant	0 14 0
Adjutant of the Royal Army Medical Corps (Volunteers)	The Pay of his Rank.

Retired Pay.

An officer of our Medical Staff, after completing ten years' service on full pay, may be permitted to retire from our army with retired pay or gratuity, according to the scale laid down in Art. 1071, if such voluntary retirement be specially recommended by our Commander-in-Chief, and approved by our Secretary of State.

The appointment of Director-General of the Army Medical Department shall be for seven years, and the retirement of the other officers of our Army Medical Staff shall be compulsory at the following ages, except that, if it should in any particular case be considered desirable in the interests of the public service, the age for the retirement of a surgeon-general may be extended for a period not exceeding two years—surgeon-general, 60 years; surgeon-colonel, 57 years; and other officers, 55 years.

Scale of Retired Pay.

	Yearly.
Director-general after three years' service in the appointment (with 30 years' service)	£1125 0 0
Under 3 years' service as Director-general and after not less than 30 years' service	875 0 0
	Daily.
Surgeon-general	£2 0 0
Colonel, R.A.M.C., and surgeon-colonel, Household Troops	£1, 10s. to 1 15 0
Lieutenant-colonel, R.A.M.C., and surgeon-lieutenant-colonel, Household Troops:—	
After 20 years' service	1 0 0
,, 25 ,,	1 2 0
,, 30 ,,	1 5 0
Lieutenant-colonel, promoted on or after 9th January 1907:—	
After 20 years' service	1 0 0
,, 25 ,,	1 2 6
,, 28 ,,	1 7 0
Major, or surgeon-major of the Household Troops:—	
After 20 years' service	1 0 0
Surgeon-lieutenant-colonel of the Household Troops:—	
After 20 years' service	1 0 0
,, 25 ,,	1 2 6
,, 30 ,,	1 5 0

	Gratuity.
Major or captain or surgeon-captain of Household Cavalry :—	
After 5 years' service in the rank of captain	£1000 0 0
,, 3 ,, ,, major	1800 0 0
,, 6 ,, ,, ,,	2500 0 0
Surgeon-lieutenant-colonel or surgeon-major of the Household Troops :—	
After 15 years' service	1800 0 0
,, 18 ,,	2500 0 0

Except in the case of a colonel promoted after the 9th January 1907, or a lieutenant-colonel, an officer of the Army Medical Service, who, on voluntary retirement, has served for less than three years in the rank from which he retires, shall be entitled only to the gratuity or retired pay assigned to the next lower rank.

PROMOTION.

Every promotion of a medical or departmental officer shall be given upon the recommendation of the Commander-in-Chief, with the approval of the Secretary of State. Promotion by selection shall be given on the ground of ability and merit, due consideration being given, however, to length of efficient service.

An officer shall be eligible for promotion to the rank of captain on the completion of three and a half years' service, and to the rank of major on the completion of twelve years' service, provided that, in each case, he has previously qualified in such manner as may be prescribed by the Secretary of State.

Promotion to the rank of lieutenant-colonel shall be made by selection from majors who have qualified in such manner as may be prescribed by the Army Council.

If an officer has passed with distinction the examination qualifying for promotion to the rank of major, the period of service required to render him eligible for the rank of major or lieutenant-colonel may be reduced as follows:—

	Months.
If he obtained a "special certificate"	18
,, passed in the 1st Class	12
,, ,, ,, 2nd ,,	6
,, ,, ,, 3rd ,,	3

Promotion to the rank of colonel shall be made by selection from lieutenant-colonels, and from lieutenant-colonels or surgeon-lieutenant-colonels of the Household Troops specially recommended to the Army Council for distinguished service in the field. Promotion to the rank of surgeon-general shall be made by selection from colonels. A colonel may also be promoted to the rank of surgeon-general, for distinguished service in the field. In cases of distinguished service in the field a departmental officer may, with the concurrence of the Lords Commissioners of the Treasury, be promoted from any rank or class to the next above it, and shall, if promoted to a rank or class having a fixed establishment, remain supernumerary in such rank or class until the occurrence of the vacancy to which in the ordinary course he would have been promoted. An officer of the Royal Army Medical Corps is eligible for promotion to brevet rank. A captain after at least six years' service, a major or lieutenant-colonel, may be promoted to the next higher rank by brevet, for distinguished service either in the field or of an exceptional nature other than in the field. If the officer dies before the date on which the notification of his promotion appears in the *London Gazette*, the promotion shall bear the date which it would have borne had the officer not died. Distinction in original investigation or research may, in the case of officers of the Royal Army Medical Corps, be regarded as "distinguished service of an exceptional nature other than in the field." An officer who does not qualify for promotion to the rank of captain or major within the periods specified, shall, unless under special circumstances, be placed on a special list with pay equal to half-pay until the date of the next examination. If he fails to qualify at the first available examination, he shall be retired from the service.

EXAMINATIONS FOR PROMOTION IN THE ROYAL ARMY MEDICAL CORPS.

Lieutenant before promotion to captain.—(For lieutenants appointed after March 31, 1901.) This examination may be taken at any time after completing 18 months' service, and will be held in the military district in which the officer is serving. The subjects of this examination, which are detailed in the King's Regulations, are as follows:—

(1) Drill; (2) duties and accounts connected with military hospitals and their supplies; (3) other duties of executive medical officers; and (4) military law.

Captain before promotion to major.—(For captains promoted to that rank after July 27, 1895.) Captains will be examined under the rules laid down in Paragraph 24, and will be eligible for acceleration in their promotion to the rank of major, under Article 352 of the Royal Warrant.

This examination, which may be taken at any time after completing five years' service, will be held in London on the termination of a period of special study. The examination will consist of written papers, essays, oral and practical examinations in the following subjects, which are detailed in the King's Regulations:—

(1) Medicine; (2) surgery; (3) hygiene; (4) bacteriology and tropical disease; and (5) one special subject, from the subjoined list, to which additions may from time to time be made—(*a*) bacteriology and tropical diseases; (*b*) dental surgery; (*c*) dermatology, including venereal diseases; (*d*) midwifery and gynæcology; (*e*) operative surgery, advanced; (*f*) ophthalmology; (*g*) otology, including laryngology; (*h*) psychological medicine; (*i*) State medicine.

Captains serving in that rank before July 27, 1895, will be promoted under the old regulations contained in Appendix I., Regulations for Army Medical Services, and will not be eligible for acceleration.

Majors before promotion to lieutenant-colonel (for majors promoted to the rank after March 31, 1895).—This examination, which may be taken at any time after three years in the rank of major, will be held in the military district in which the officer is serving, at times which will be duly notified. The subjects of this examination, which are detailed in the King's Regulations, are as follows:—

(1) Military law; (2) army medical organisation; (3) sanitation of towns, camps, transports, etc.; epidemiology and the management of epidemics (4) (*a*) medical history of important campaigns; (*b*) a general knowledge of the Army Medical Services of other Powers; and (*c*) the laws and customs of war in relation to the sick and wounded.

The questions and answers will be forwarded, under a sealed confidential cover, to the Director-General of the Army Medical Department, for transmission to the examiners, who will report to the Director-General as to the competence of the officer examined.

INDIAN MEDICAL SERVICE.

The regulations for the examination of candidates for admission to His Majesty's Indian Medical Service differ only slightly from those of the home service. The declarations are sent to the Military Secretary, India Office, Westminster.

The physical fitness of each candidate will be determined previous to examination by a board of medical officers, who are required to certify that his vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. Further particulars as to the standard of eyesight will be found in a pamphlet by Sir J. Fayrer, M.D., K.C.S.I., entitled "Regulations as to Defects of Vision," published by Messrs. J. & A. Churchill, 7 Great Marlborough Street, W. A moderate degree of myopia will not be considered a disqualification, provided it does not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes exists. Every candidate must also be free from all other organic disease, and from constitutional weakness, or other disability likely to unfit him for military service in India. Candidates who pass the Medical Board Examination will be required to pay a fee of £1 before being permitted to compete.

On producing the foregoing qualifications, the candidate will be examined by the Examining Board in the following subjects, and the highest number of marks attainable will be distributed as follows:—

	Marks.
1. Medicine, including therapeutics	1200
2. Surgery, including diseases of the eye	1200
3. Surgical anatomy and physiology	600
4. Pathology and bacteriology	600
5. Midwifery and diseases of women and children	600
6. Chemistry and pharmacy, with either botany or zoology	600

After passing this examination, the successful candidates are required to attend a four months' course of practical work at Aldershot and the Army Medical College, in (1) internal economy, (2) Indian military law, (3) hospital administration, (4) drill, (5) riding, (6) map reading, (7) military and tropical medicine, (8) military surgery, (9) hygiene, (10) pathology of tropical diseases. During this course candidates receive an allowance of 14s. per day.

At the conclusion of the course, and after the leaving examination, the position of the candidates on the list of surgeon-lieutenants will be determined by the combined results of the Preliminary and Final Examinations, and, so far as the requirements of the service will permit, they will have the choice of commands in India (*i.e.* Bengal, Punjab, Madras, or Bombay) according to their position in that list.

Officers appointed to the Indian Medical Service will be placed on one list. Though ordinarily employed within the limits of the command to which they may have been posted, they will be liable to employment in any part of India, according to the exigencies of the service.

No candidate will be permitted to compete more than three times.

Examinations for admission to the service usually take place twice in the year, *i.e.* in February and August.

The examiners in London will prepare a list in order of merit, with the marks affixed in the different subjects, to be transmitted to the Director-General and communicated to the professors of the Army Medical School. If any candidate is found to be deficient in any particular subject, this shall be stated, in order that he may receive special instruction on the point at Netley.

PAY AND ALLOWANCE.

The following are the rates of "Indian pay and allowances" which will be drawn by officers hereafter appointed to the Indian Medical Service:—

Rank.	Years' Service.	Indian Pay and Allowances per mensem. When not holding an appointment carrying higher pay.
		Rs.
Lieutenant-colonel specially selected for increased pay		1000
Lieutenant-colonel	25 and over	900
,, ,,		900
Major	15 ,,	750
,,		650

Rank.	Years' Service.	*A.* When not receiving any Staff Allowance.	*B.* When receiving Staff Allowance in addition.
		Rs.	Rs.
Captain	10 and over	550	500
,,	5 ,,	450	400
Captain	under 5	400	350
Lieutenant		350	300

On first appointment they will only come into receipt of "Indian pay and allowances" (Column *A*) from the date of their arrival in India.

Officers holding the principal administrative appointments and substantive military charges of the Indian Medical Service, receive at present the following consolidated salaries:—

	Rs. per mensem.	
Surgeon-general	2200 to 3000	
Colonel from	1800	
Colonel to	2250	
Lieutenant-colonel of twenty years' service and upwards	1100 with Rs. 90	horse allowance in cavalry regiments.
Lieutenant-colonel, in substantive charge of a native regiment	1250 with Rs. 90	do.
Major, under twenty years' service, in substantive charge of a native regiment	900 with Rs. 90	do.
Captain, above five years' full pay service, in substantive charge of a native regiment	600 with Rs. 60	do.
Captain, or lieutenant under five years' do., in substantive charge of a native regiment	500 with Rs. 60	do.

The salaries of other substantive medical appointments in the civil and military departments are consolidated, and vary from Rs. 2000 to Rs. 450 per mensem.

LEAVE RULES.

Officers of the Indian Medical Service, below the rank of surgeon-colonel, may be granted—(1) Privilege leave, under such regulations as may from time to time be in force; (2) leave out of India, for no longer period than one year, capable of extension to two years' absence from duty, on the following pay:—

After arrival in India, on first appointment				£250 a year.
After the commencement of the 5th year's service for pension				250 ,,
Do.	do.	10th	do.	300 ,,
Do.	do.	15th	do.	450 ,,
Do.	do.	20th	do.	600 ,,
Do.	do.	25th	do.	700 ,,

(3) Leave in India, but for the period of one year only, on full military pay and half the staff salary of appointment.

RETIRING PENSIONS AND HALF-PAY.

Officers of the Indian Medical Service will be allowed to retire on the following scale of pension, on completion of the required periods of service :—

After 30 years' service for pension	£700 per annum.
,, 25 ,, ,, ...	500 ,,
,, 20 ,, ,, ...	400 ,,
,, 17 ,, ,, ...	300 ,,

Officers placed on temporary or permanent half-pay are granted half-pay at the following rates :—

	Rates of Half-pay.	
	Per diem.	Per annum.
	s. d.	£ s. d.
Under 5 years' service	6 0	109 10 0
After 5 ,, ...	8 0	146 0 0
,, 10 ,, ...	10 0	182 10 0
,, 15 ,, ...	13 6	246 7 6

Officers cannot retire *in India* on half-pay (No. 45, 28th February 1865).

NAVY MEDICAL DEPARTMENT.

The regulations for this service correspond very closely to those for the army, with the following exceptions :—

The candidate must also declare his readiness to engage for general service at home or abroad as required.

The official requirements in the natural sciences are as follows :—

Zoology.—The examination in zoology will include the general principles of biology and a comparison of animals with plants; the distinctive characters of the larger group of animals—the protozoa, cœlenterata, vermes, arthropoda, mollusca, echinodermata, and vertehrata—as illustrated by common types; the elements of embryology; animal parasites.

Botany.—The general principles of the morphology and physiology of low forms of life, for example, torula, bacteria, spirogyra, moss, fern; the general morphology of flowering plants; diagnosis of the important British natural orders; medicinal plants.

Physics.—The general principles of mathematics, acoustics, optics, heat, magnetism and electricity, as: the property of solids, liquids, and gases; conservation of energy, specific gravity, propagation and reflection of sound and light, temperature, specific and latent heat, thermometers, properties of mirrors and lenses, chromatic dispersion of light, forms of batteries, galvanic and frictional electricity, general properties of magnets.

Physical geography.—The relation of the earth to the rest of the solar system, nature of the earth's crust; the chief kinds of rocks; general configuration of land and water, mountains, plains, lakes, rivers, islands, glaciers and icebergs; the ocean currents, tides, the earth's atmosphere, winds and storms, dew, rain, climate, volcanoes, earthquakes, general distribution of animal and vegetable life.

Successful candidates, immediately after passing the examination, will receive commissions as surgeons in the Royal Navy, and will undergo a course of practical instruction in naval hygiene, etc., at Haslar Hospital.

PAY AND RANK.

Rank.	Daily. £	s.	d.	Yearly. £	s.	d.
Surgeon—on entry	0	14	0	255	10	0
,, after 4 years' full-pay service	0	17	0	310	5	0
Staff-surgeon (or surgeon over 8 years)—on promotion	1	0	0	365	0	0
,, after 4 years' full-pay service in rank	1	4	0	438	0	0
Fleet-surgeon—on promotion	1	7	0	492	15	0
,, after 4 years' full-pay service in rank	1	10	0	547	10	0
,, ,, 8 ,, ,,	1	13	0	602	5	0
,, ,, 12 ,, ,,	1	16	0	657	0	0
Deputy inspector-general	2	2	0	766	10	0
Inspector-general	...			consolidated.		

On first appointment to the service, medical officers will receive full pay from date of appointment, but subject to the provisions of Art. 1342, Clause 2, of the Queen's Regulations, 1893.

The allowance of 5s. a day, in addition to full pay, at present granted to the fleet-surgeon of a flag ship, bearing the flag of a commander-in-chief on a foreign station, will be given to the senior medical officer, being a fleet- or staff-surgeon, and an allowance of 2s. 6d. a day to the senior medical officer, being a fleet- or staff-surgeon, of the ship of a commodore, or of a senior officer commanding a foreign station.

Medical officers conducting the course of instruction at Haslar Hospital will receive the following allowances:—

The senior officer employed upon this duty	£150 a year.
The junior officers assisting	50 a year.

The hospital allowances for naval medical officers at home and abroad, in lieu of provisions for themselves and servants, and for fuel and light, are as follow:—

	At Home.	Abroad.
Deputy inspectors-general	£67	£112
Fleet-surgeons and staff-surgeons	53	112
Surgeons	39	108

Medical officers serving afloat receive an allowance of 1s. 6d. a day in lieu of provisions, fuel and lights, as laid down in the King's Regulations. The travelling allowances, extra pay, lodging money, and compensation for losses, are fixed for naval medical officers according to their relative rank in the service.

HALF-PAY.

The undermentioned scale of half-pay is substituted for that hitherto in force:—

Rank.	Daily.			Yearly.		
	£	s.	d.	£	s.	d.
Surgeon—under 2 years' full-pay service	0	6	0	109	10	0
,, after 2 years' full-pay service	0	7	0	127	15	0
,, ,, 4 ,, ,,	0	8	0	146	0	0
,, ,, 6 ,, ,,	0	9	0	164	5	0
Staff-surgeon (or surgeon over 8 years)—on promotion	0	10	0	182	10	0
,, after 2 years' full-pay service in rank	0	11	0	200	15	0
,, ,, 4 ,, ,,	0	12	0	219	0	0
,, ,, 6 ,, ,,	0	13	0	237	5	0
Fleet-surgeon—on promotion	0	14	0	255	10	0
,, after 2 years' full-pay service in rank	0	15	0	273	15	0
,, ,, 4 ,, ,,	0	17	0	310	5	0
,, ,, 6 ,, ,,	0	18	0	328	10	0
,, ,, 8 ,, ,,	0	19	0	346	15	0
,, ,, 10 ,, ,,	1	0	0	365	0	0
Deputy inspector-general—on promotion	1	5	0	456	5	0
,, after 2 years' full-pay service in rank	1	7	0	492	15	0
,, ,, 4 ,, ,,	1	9	0	529	5	0
Inspector-general	1	18	0	693	10	0

PRISON MEDICAL SERVICE.

This branch presents limited opportunities, either for entrance, or for subsequent advancement. The smaller prisons are officered, as a rule, by local practitioners. The medical officers to the larger prisons are appointed by the Convict Prison Board, or the Prison Commission. Special forms may be obtained from the secretary of the latter at the Home Office, on which applications are to be made. In the Convict Service there are eight posts, with salaries ranging from £250 to £550; in the Local Prison Service twenty-eight officers, with salaries from £250 to £500.

COLONIAL SERVICES.

Applicants for posts under the Colonial Office must be between the ages of 23 and 30, be doubly qualified, and preferably have held hospital appointments. The usual certificates require to be shown, and an official medical examination undergone. Applications for posts or for information are to be sent to the assistant-secretary, Colonial Office. As a rule, about twelve to fifteen vacancies occur annually. In addition to these, a number of semi-official appointments are made yearly by this office, in connection with public works, etc., in the Colonies.

PRACTITIONERS ABROAD.

In the majority of the British Colonies local registration of legal British qualification suffices to allow a practitioner to pursue the duties of his profession. Only in two (cf. Table VII.)

is this unnecessary; while in one, Ontario, a local diploma must be gained after examination.

A certain number of medical appointments in various Protectorates and Legations are also held under the Foreign Office. Information may be obtained from the Assistant Secretary, Foreign Office.

Few of the foreign nations allow British registered practitioners to practise, unless they first pass the State examinations. Table VII. gives a tabular view of the different regulations current:—

TABLE VII. COLONIES AND COUNTRIES IN WHICH DULY REGISTERED BRITISH GRADUATES AND DIPLOMATES CAN PRACTISE.

1. Without Compulsory Local Registration.

New South Wales, South Australia, Italy (only among visitors and aliens).

2. (*a*) After Local Registration.

Victoria, Tasmania, Queensland, New Zealand (£1, 5s. fee); Western Australia, Natal[1] (£1, 1s. to £3, 3s.); Cape Colony (£5 fee); Prince Edward Island ($20); New Brunswick ($1 to $2 a year); Nova Scotia, Quebec, Manitoba, North-West Territories ($50, and $1 to $2 a year); British Columbia, Jamaica, Klondyke ($50 fee); British Guiana, Fiji, Gold Coast, Gibraltar, Leeward and Virgin Islands, Monaco; Japan (6s.).

(*b*) After Application for Permission.

Belgium, Greece (examination in French or English); Italy.

3. Only after Examination.

State examination.—Austria, Denmark, Holland, Germany, Greece, Portugal, Roumania (*vivâ voce*), Russia, Norway, Spain, Sweden, Switzerland, Brazil (in French or Portuguese).

University or local examinations.—France, Turkey (£4, 10s. fee); Argentine (in Spanish); Chili (*vivâ voce*); Peru (*vivâ voce*); Uruguay (*vivâ voce*); Ontario.

4. America.

Twenty-four States require the passing of an examination; seventeen States require the same, or approval of the diploma presented by the applicant; and in nine, presentation of the diploma or degree is sufficient. The last nine are—

Alaska Territory, District of Columbia, Michigan, Arkansas, Kansas, Ohio, Arizona Territory, Nevada, Wyoming.

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[1] Annual licence also of £5.

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B N D E
BOSTON